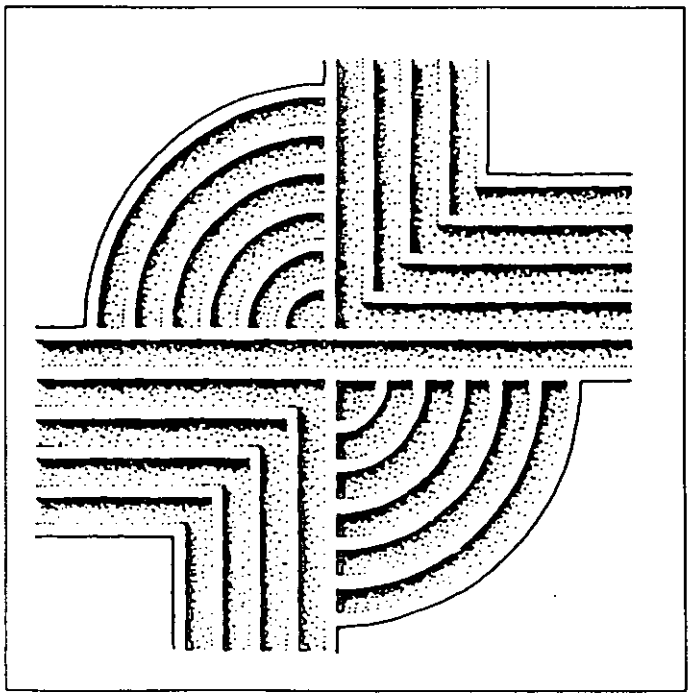
ARCHAEOLOGICAL AND HISTORICAL INVESTIGATION OF A PORTION OF THE S&O AND SPRINGFIELD CANALS, CITY OF SAVANNAH, CHATHAM COUNTY, GEORGIA



CHICORA RESEARCH CONTRIBUTION 235

ARCHAEOLOGICAL AND HISTORICAL INVESTIGATION OF A PORTION OF THE S&O AND SPRINGFIELD CANALS, CITY OF SAVANNAH, CHATHAM COUNTY, GEORGIA

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Chicora Foundation Research Series 235

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December 3, 1997

This report is printed on permanent paper ∞

ABSTRACT

This study reports on both documentary research and field survey associated with the Springfield Canal Drainage Improvements Project currently being planned by the City of Savannah. The project would begin immediately south of previously documented tidal gates and a pump station currently under construction on what is the Savannah and Ogeechee (S&O) Canal and would involve widening the canal from its current partially filled-in condition as well as dredging in order to maintain flow. This widening would shift from both sides of the centerline to the southern side in the vicinity of Gays Locks. It is in this area that the route of the S&O is abandoned and project begins to follow the Springfield Canal. From that point southward for about 400 feet a transition to the current banks is proposed and for the remainder of the project only dredging, which is an annual to semi-annual event, is anticipated.

The research included a historical overview of the S&O and Springfield Canals, a review of the National Register documents for those resources in the project area currently listed on the Register, as well as a review of other structures associated with the canals. In particular research focused on the Main Line and Dooley Yard Viaducts (listed as part of the Central of Georgia Railroad: Savannah Shops and Terminal Facilities), the Louisville Road Bridge over the S&O Canal, and the Laurel Grove South Cemetery.

The field investigations included a pedestrian survey of both banks of the project area from the tidal locks southward to the vicinity of Stay Street. Shovel testing was conducted at 100 foot intervals with closer interval testing in those areas where archaeological materials were encountered. This testing was intended to not only identify archaeological sites, but was also designed to help document the soil conditions in the project area, further refining our understanding of fill episodes and construction activities.

Two archaeological sites were identified in the project corridor, 9CH879 and 9CH880. Both represent cultural materials incorporated into fill and are not in primary context. Both are recommended not eligible for inclusion on the National Register of Historic Places.

The Main Line and Dooley Yard Viaducts are currently listed on the National Register, but will not be impacted by the proposed project. The study does, however, recommend additional structural examination of the Main Line Viaduct to ensure that the proposed actions will not undermine its pier system. It may be that rip-rap will help stabilize the banks in the vicinity of these viaduct piers. Likewise, Laurel Grove Cemetery South is listed on the National Register, but it will not be impacted. A penetrometer was used in project corridor to determine if unrecorded burials might be present. None were encountered. No additional action is recommended in this area.

The Louisville Road bridge over the S&O Canal was also documented by this study. Although the proposed action will not require replacement of this span, documentation was undertaken in order to better understand the bridge's significance. Based on our evaluation, the bridge is recommended eligible for inclusion on the National Register. This bridge, however, has been given a very low sufficiency rating by the Georgia Department of Transportation and it is likely that replacement will be necessary in the near future.

Although the S&O Canal will be widened in this project, that widening will essentially remove fill materials placed in the canal over the past 50 years. The result of the work will be to at least partially restore the canal to its original design and appearance. The work will shift entirely to the south side in the vicinity of Gays Locks, which are now filled in. This will help ensure that the locks are not impacted by the proposed action. The study does recommend consideration of

additional erosion control in the vicinity of the intact lock wall on the edge of the canal. South of the this set of locks the work shifts to the Springfield Canal corridor, although no widening is anticipated.

Dredging of the canal is routine, so it is unlikely that the work will impact any previously unrecognized underwater archaeological resources. Of greater concern is that the dredge spoil be contained to those areas previously used for spoil and that no new areas adjacent to the canal be used.

Although this investigation has been intensive, extensively exploring the canal edge and associated structures, there is always the possibility that additional archaeological remains. may be encountered during construction. Consequently, we recommend that should construction crews encounter bricks, tabby, pottery, bottles, arrowheads, large concentrations of pottery, bones, or other archaeological remains, the work be suspended until the finds can be examined by a professional archaeologist or the staff of the Georgia State Historic Preservation Office.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

We want to thank Mr. Ray Pitman with Thomas and Hutton for his interest in the heritage of the project area and concern that the project be conducted in a sensitive manner. We also appreciate his continued confidence in Chicora and our efforts to preserve and protect the heritage of the region.

A number of individuals have assisted in the course of this study, including several associated with the City of Savannah. The City's project engineer, Mr. Gilford Mooring was particularly helpful, searching out additional plans and assisting us in making contact with the appropriate individuals. He also took the time to assist in the evaluation of the Louisville Road bridge. We also want to thank Ms. Glenda Anderson, the Director of the City's Archives and Library. She took considerable time and effort to help us not only track down important plans and maps, but also to shepherd them through the process of copying.

In our work to document the Louisville Road bridge we have received considerable assistance from a number of individuals. With the Georgia Department of Transportation, Mr. Slade Cole, District Construction Engineer in Savannah helped us make contact with the right individuals; Mr. Joe Cannon, Assistant Bridge Inspector with the 5th District searched the records and helped us begin to understand the uniqueness and significance of this particular bridge; and Mr. Bill Duvale, Bridge Design in Atlanta, provided additional documentation for this particular design. Mr. Bill Huffstatler, P.E. with Wilber Smith Associates in Columbia, who has extensive experience in documenting historic bridges in South Carolina, North Carolina, and Florida, was kind enough to provide his time and expertise to help us understand the design features of the bridge.

Mr. Lee Webb, the Georgia State Historic Preservation Office, provided invaluable assistance obtaining copies of the necessary National Register nomination forms. The staff at the Georgia Archaeological Sites Files was especially generous of their time and helped us not only obtain site numbers in record time, but also provided essential background materials. The staff and archivists at the Georgia Historical Society were very generous in their time, searching out important materials for us and making a number of copies.

Finally, we want to thank Mr. Ian Hamer and Mr. Todd Hejlik for their survey skills and efforts along the banks of the S&O and Springfield canals. Also, Ms. Debi Hacker for the analysis of materials in the field and for the preparation of the graphics in this report.

INTRODUCTION

Background

In July 1997 Mr. Ray Pitman, P.E., with Thomas and Hutton Engineers, contacted Chicora Foundation requesting a proposal to conduct cultural resources research on the proposed Springfield Canal Drainage Improvements project that was in the planning stages for the City of Savannah. Aware of the extraordinary archaeological and engineering resources in this section of Savannah, both the City and Thomas and Hutton wanted to ensure that the project would not impact any significant archaeological or historical features.

The scope of the project was refined over the course of the following months, as plans for the drainage improvements were finalized and various other permitting issues were resolved. By November 5 Chicora Foundation was given the notice to proceed on a project that was defined as incorporating four specific tasks. These tasks were:

- to document the terrestrial archaeology with an intensive survey using shovel testing at 100 foot intervals for the first mile of the project;
- to document the two brick railroad trestles (recognized as significant resources) crossing the canal;
- to document the impact of the project on Laurel Grove South Cemetery (known to be on the National Register); and
- to document the impact of the project on Gay's Lock No. 2 on the S&O Canal (recently added to the National Register).

The project, in general, involved improving the conditions, drainage and flow patterns, and aesthetics of sections of both the Savannah and Ogeechee (S&O), and Springfield canals. The project area is situated on the northwestern and western edges of the City of Savannah in central Chatham County, Georgia (Figure 1).

More specifically, the first leg of the project involves widening the S&O Canal from its current nominal width of 15 to 35 feet to a standard width of 40 feet, typically 20 feet each side of the canal centerline. In addition, the bottom of the canal would be dredged to a uniform bottom depth of about 3 feet below the mean water level.

This first leg would begin about station 13+00, immediately south of the concrete tidal gates previously documented by Chicora Foundation (Trinkley 1996) and south of a new pump station currently under construction. This work continues to about station 38+00, just east of Gay's Lock Number 2 on the S&O Canal. At this point the canal widening would be shifted entirely to the south side in order to avoid impact to the locks, situated to the north of the current canal centerline (Figure 2). The only exceptions to this plan are in the areas of two brick railroad trestles, at stations 21+00 and 24+65, and the Louisville Road bridge, at station 25+30. In these areas the canal width would be reduced to that of the current viaduct spans.

For this first leg construction activities would include removal (and in some instances, replacement) of modern concrete or wood bridges, excavation and shaping of the canal banks, dredging, hauling surplus materials, placement of rip rap around bridge abutments and in erosional areas, and cleaning of adjacent construction easements (totaling about 75 feet on each side of the centerline). As a result, there is the potential for considerable damage to any extant

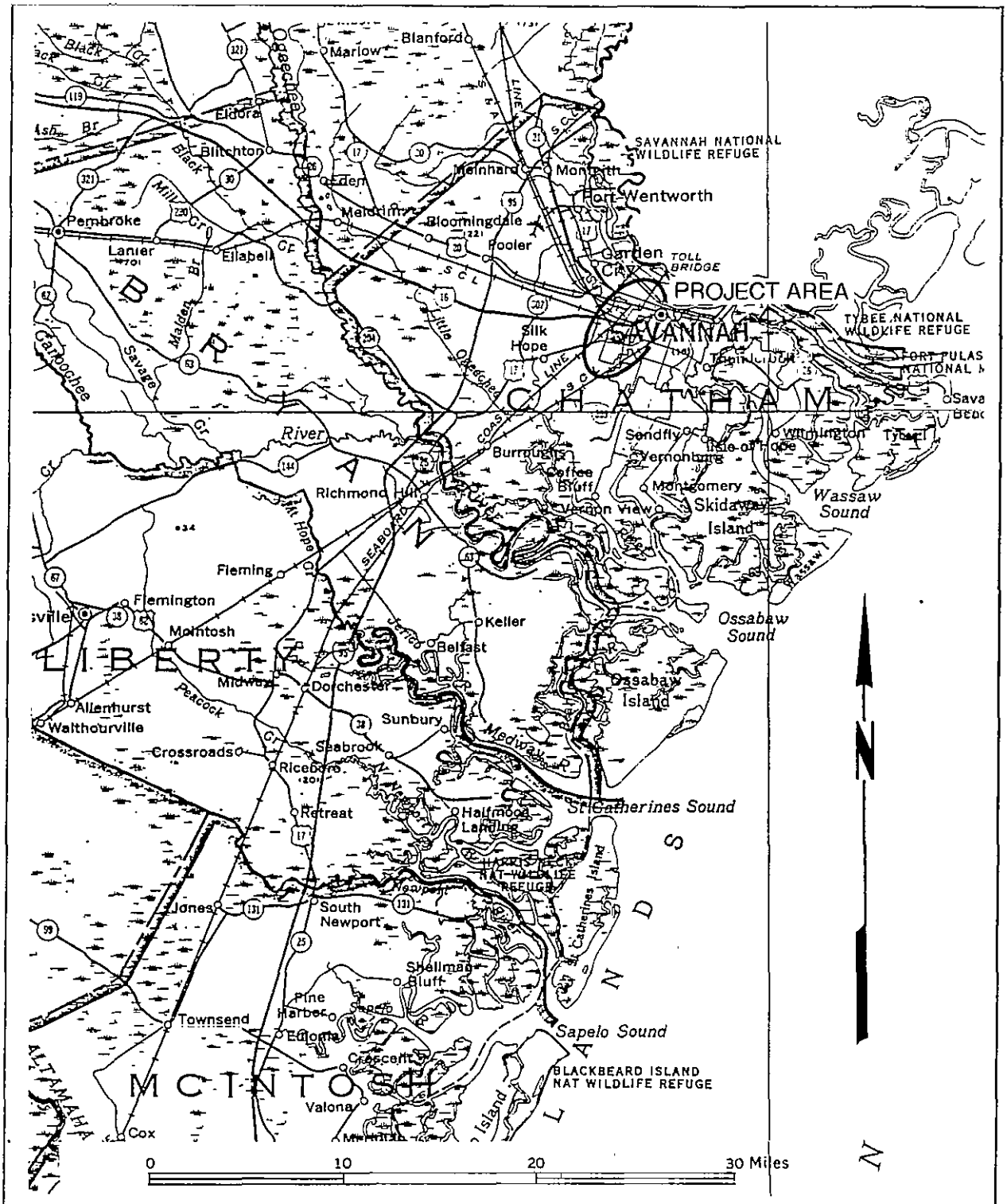

Figure 1. Location of the project in coastal Georgia (base map is USGS, State of Georgia, 1977, 1:500,000).

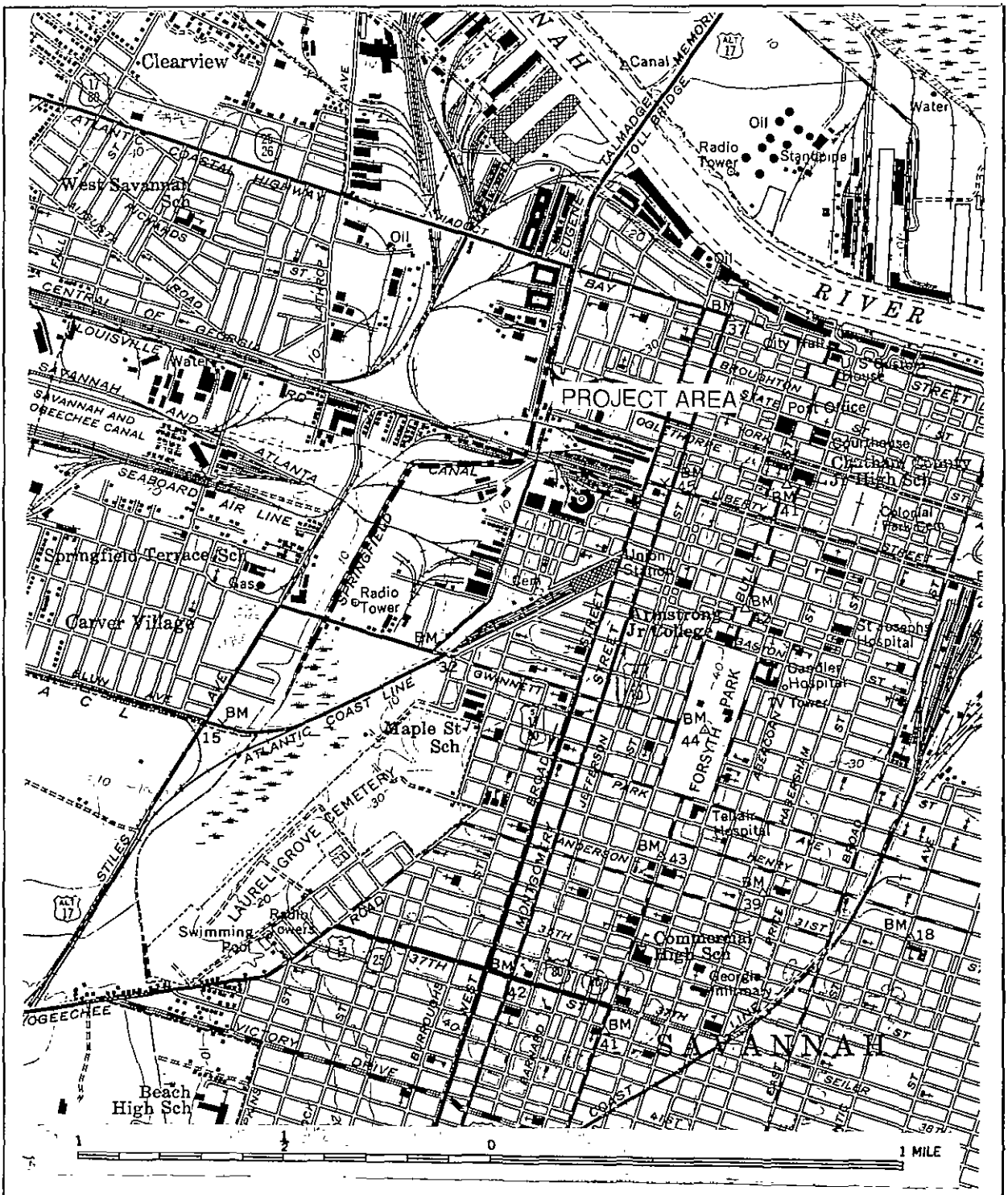

Figure 2. City of Savannah map showing the project area, road crossings, and other general features.

archaeological or historical sites in this area.

The second leg of the project would not involve any widening, but only dredging of the canal, again to a standard depth. This dredging, of course, is a fairly routine event and has been previously done throughout the project corridor.

This work would begin immediately past Gay's Lock Number 2, about station 42+00, and continue southwardly to the project terminus, just past Stark Street. Our investigations, however, terminated just south of Stay Street, about Station 69+00 (Figure 2). The only area south of this which was examined was the east edge of the canal in the vicinity of Laurel Grove South Cemetery, where the canal cuts through the cemetery property.

This second leg of the work would include more limited construction activities. A construction easement, about 75 feet in width on either side of the centerline, would still be requires, but no work on the banks is anticipated. Construction impacts are limited primarily to damage which might be caused by the operation of heavy equipment in this easement. However, it is important to note that these activities have taken place in the past and it is probable that whatever can be damaged has already been impacted during previous activities.

The reason the project scope included only the first mile of the proposed project is that beyond this impact is anticipated to be so minor (with the possible exception of the area around Laurel Grove South Cemetery, which was included in the scope) that no survey was thought necessary. In addition, past this point the project impacts only the Springfield Canal, a drainage feature which is not listed on the National Register (unlike the S&O Canal). Our survey tends to support this decision. Past about station 42+00 the project enters an area of very low, poorly drained soils and heavy industrial development.

The survey, which was designed to identify prehistoric or historic resources which may be within the project corridor, was conducted November 17 by Dr. Michael Trinkley, Mr. Ian Hamer, and Mr. Todd Hejlik. A total of 27 person hours were required for the study. In addition, Dr. Trinkley conducted two days of research at the Georgia Historical Society and one additional day of research was conducted by Ms. Kerri Barile, focused specifically on the Louisville Road bridge.

Goals and Methods

The primary goals of this study were, first, to identify the archaeological and historical resources of the survey area and, second, to assess the ability of those resources to contribute significant archaeological, historical, or anthropological data. The second aspect essentially involves the site's eligibility for inclusion on the National Register of Historic Places, although Chicora Foundation only provides an opinion of National Register eligibility and the final determination is made by the lead compliance agency in consultation with the State Historic Preservation Officer at the Historic Preservation Division of the Georgia Department of Natural Resources.

The methodology employed for site identification will be discussed in a following section, but for the purposes of this study an archaeological site is identified as ten or more artifacts within a 50-foot area.

Once identified, archaeological sites were evaluated for their potential eligibility for inclusion on the National Register of Historic Places. This assessment process follows that outlined by Townsend et al. (1993) in *National Register Bulletin* 36. This evaluative processes involves five steps, forming a clearly defined, explicit rationale for either the site's eligibility or lack of eligibility. Briefly, these steps are:

- identification of the site's data sets or categories of archaeological information such as artifacts, subsistence remains, architectural remains, or sub-surface features;

- identification of the historic context applicable to the site,

providing a framework for the evaluative process;

- identification of the important research questions the site *might* be able to address, given the data sets and the context;

- evaluation of the site's archaeological integrity to ensure that the data sets are sufficiently well preserved to address the research questions; and

- identification of "important" research questions among all of those which might be asked and answered at the site.

Taking each of these steps individually, the first is simply to determine what is present at the site — for example, are features present, what types of artifacts are present, from what period does the site date? This represents the collection of basic, and essential, information concerning the site and the types of research contributions it can offer. Obviously there is no reason to propose research on eighteenth century plantation development if only early twentieth century ceramics are present. Nor is it perhaps appropriate to explore questions focused on subsistence if no faunal materials are present in the collection. This first step is typically addressed through the survey investigations, often with supporting documentation provided by historic research.

Next, it is important to understand the historic context of the site — what is the history of the project area and of the specific locality? Research questions must be posed with an understanding of this context and the context helps to direct the focus of research. The development of a historic context can be a lengthy process. The historic synopsis in this study provides a preliminary context for a wide range of different site types, although we recognize that it many ways it is superficial and lacking in detail.

Associated with the development of the context is the formation of research questions ***applicable to the site, its context, and its data sets.*** Often this research will grow out of previous projects in the area. Certainly topics of exceptional interest continue to be the examination of Woodland ceramics and settlement systems, the spread of settlement into the Savannah hinterlands during the eighteenth century, and the development and lifeways of the marginal classes that lived on the fringe of Savannah during the nineteenth and early twentieth centuries.

Next it is essential to compare the data sets with the research questions — the information necessary to address the research questions must be present at the site, else posing the question is meaningless in the evaluative process. Focusing on small projects, it may be more appropriate to concentrate on only one or perhaps two research questions and devote the energy necessary to fully explore them, then to propose a range of questions which can be only superficially explored with the data sets or resources available.

Finally, Townsend et al. recognize that not all research questions are of equal importance and that only those of fairly high value should be considered in the evaluation of National Register eligibility. Of all the steps this may be the most difficult to address. Some research questions proposed may seem pedestrian. Our society has viewed history as great events happening to great individuals. Many view architectural significance with the same jaundiced eye — significance being equated with white columns and famous architects. And certainly if the available archaeological studies of low country plantations are examined, there is a similar bias toward big plantations with relatively grand lifeways. Curiously, we know much less about the common planter, the yeoman farmer, or the tenant — and their probably more vernacular architecture — than we do about the famous or the high style. Some historians have referred to the common man as the "invisible person." Others have offered some understanding using the concept of the "marginal man." It is consequently important to understand that significance of archaeological research questions is not judged from the perspective of the wealth, or power, or prestige of

Table 1.
Georgia's Criteria for Historical Significance of Bridges,
prepared by the Historic Preservation Section, Georgia Department of Natural Resources
October 21, 1980

In General:
Criteria for determining the eligibility of historic bridges should be based on the standard National Register Criteria for Evaluation.

More Specifically:
Criteria for evaluating historic bridges should include consideration of:

1. *Integrity* of:
   a. location (in original location or moved according to historical practices);
   b. setting (compatibility of condition of current setting with original setting);
   c. design (form, type, general arrangement);
   d. materials (original construction materials, except for elements routinely repaired or replaced);
   e. workmanship (signs of construction techniques, fabrication methods, craftsmanship).

2. *Representativeness*, the ability to characterize or typify, in terms of location, setting, design, materials, and/or workmanship.

3. *Singularity*, the quality of being unusual, distinctive, distinguished, or unique, in terms of location, setting, design, materials, and/or workmanship.

4. *Condition*, only insofar as it affects formal or material integrity (note: "functional" integrity — the ability of a bridge to continue serving in that capacity — is not a National Register criteria for evaluating bridges).

5. *Chronology*, the quality of being "sufficiently old" for evaluation; in general bridges built through the mid-1930's [today this would be mid-1940s] are "sufficiently old" but this cut-off date may vary according to bridge type and location; newer bridges will have to justify an exception to this rule.

6. *Historical Association*, in terms of:
   a. periods, events, activities, or people in local, regional, state, or national history;
   b. bridge builders, engineers, companies.

7. *Place Association*, as part of a recognized historical "place," in terms of:
   a. traditional crossings; if it maintains the environment of an earlier crossing, it may be historically significant;
   b. associated development (mills, stores, houses, etc.).

8. *Information*, the ability to yield valuable and/or otherwise unavailable data about historic bridge design, construction, materials, etc.

the historic persons involved. It is judged from the perspective of what the research can tell us about the past that traditional historical research cannot.

This approach, of course, has been developed for use documenting eligibility of sites actually being nominated to the National Register of Historic Places where the evaluation process must stand alone, with relatively little reference to other documentation, and where only, typically, one discrete site is being considered. In the case of survey evaluations some modifications of the approach seem reasonable, if not actually essential. Regardless, the approach advocated by Townsend et al. encourages researchers to carefully consider, and justify, their recommendations regarding National Register eligibility.

In assessing the eligibility of the Louisville Road bridge a somewhat different approach has been used. The National Research Council, Transportation Research Board has carefully documented attempts to develop decision making criteria for historic bridges (Chamberlan 1983). Although more than a decade old, the document is carefully written and impartially presents the history of preservation in bridges on federal highways. The work by the Georgia Department of Transportation, in conjunction with the Georgia Department of Natural Resources, represents on the earliest efforts to develop a technique for evaluating the eligibility of historic bridges. The approach used (see Table 1) is described by Chamberlan as based on "modified National Register methods."

Our assessment of the Louisville Road bridge follows the system outlined by Georgia. Although more intuitive than numerical ranking systems, the Georgia approach also does not include criteria which are clearly not appropriate for eligibility considerations, such as "preservation potential," "aesthetics," and "accessibility." While these, and other, considerations may be valid in terms of how significant bridges are managed, they do not seem appropriate for consideration in the eligibility process.

Curation

Archaeological site forms have been filed with the Georgia Archaeological Sites Files. The field notes and artifacts resulting from these investigations will be temporarily maintained by Chicora Foundation.

The field records have been transferred to clean, pH neutral, alkaline buffered permanent paper. The artifacts are housed in ziplock bags with pH neutral, alkaline buffered tags. Photographic materials, which consist only of color prints, are not archivally stable and are therefore been retained in Chicora's project files.

THE ENVIRONMENT OF THE CITY

Physiographic Area

Savannah is situated in the north central portion of Chatham County in the eastern corner of Georgia bordering the Savannah River about 15 miles northwest of the Atlantic Ocean (see Figure 1). Situated in the Coastal Plain Province, Savannah is still within the Barrier Island Sequence, characterized by elevations ranging from sea level to about 160 feet above mean sea level (AMSL) (Hodler and Schretter 1986:17).

In this area the advance and retreat of the sea have left six distinct shoreline deposits forming step-like progressions of decreasing elevations as one moves toward the ocean. Savannah is found at the junction of three of these: the Silver Bluff is at elevations of less than 10 feet, the Pamlico Formation is at elevations of between 10 and 20 feet, and the Penholoway Formation is between 30 and 70 feet (Wilkes et al. 1974:69). In areas which have been dissected marshes have formed in poor drainages. This area is also often called the Atlantic Coast Flatwoods. It is characterized by nearly level topography and poorly drained soils.

As DeBraham noted, "the Plane of the City is at the highest Place, 30 feet above the surface of the Stream [Savannah River] (DeVorsey 1971:152). Although the elevation of Chatham County ranges from about 37 to 81 feet AMSL, those in downtown Savannah range from about 37 to 41 feet AMSL, situated almost entirely in the Penholoway Formation.

Looking at a map of early Savannah, however, it becomes clear that the town was laid out on a sandy ridge between two low marshes which historically where used for rice cultivation. The project area is situated on the western side of the City. The Savannah and Ogeechee (S&O) Canal hugged the western side of the sand ridge then turned into the rice fields when it was built. The Springfield Canal, constructed later than the S&O Canal, was placed further to the west, in some areas in the drainage of Musgrove Creek. Constructed as a drainage canal, it follows low land throughout its course. Elevations in the project area range between about 5 and 10 feet AMSL (with most under 7 feet AMSL), clearly evidencing the areas low, wet condition prior to the construction of the canals and other steps to drain this area around Savannah.

Soils and Geology

Although Francis Moore observed "a variety of soils" in the vicinity of Savannah, including "sandy and dry," "clay," and "black rich garden mould well watered" in 1735 (Moore 1840:I:n.p.), it would be the dry sands which would characterize Savannah. DeBraham, for example, recounted that the soils is "a single Stratum of Sand from 24 to 30 feet deep down to the general Springs (water Root) in the Quick Sand, on which Dew and Rains strains" (DeVorsey 1971:154). Richard Haunton (1968:26-27) also comments on Savannah's sandy streets which were impassable in wet weather.

In general, the area around Savannah is predominately flat to nearly level, interspersed with numerous drainages. While some areas, such as the bluff on which the city is situated, are well drained, there are many areas which are naturally poorly drained (at least in part accounting for the city's health problems discussed below). The soils are underlain by and developed from beds of unconsolidated sands, sandy clays, and clays of recent geologic origin. Most of the soils are light colored and contain small amounts of organic matter. All of the soils range from medium to strongly acid in reaction.

The project area is entirely within the Ogeechee-Urban land complex, defined as consisting of about 40% to 60% Ogeechee soils and 20% to 40% urban land, with the rest being

Pelham, Ocilla, and Ellabelle soils. This complex is typically found in wet areas. In most places the surface or A horizon soils are very dark gray (10YR3/1) loamy fine sands to upwards of 20 inches in some areas. Under these are a dark grayish-brown (10YR4/2) sand clay loam (B1tg horizon) (Wilkes et al. 1974:29). The urban land, however, may have an appreciably different profile, typically being altered by cutting, filling, grading, and shaping. Wilkes et al. note that "identification of the soils in urban land is impractical because they are obscured by works and structures" (Wilkes et al. 1974:29), as well as other disturbances.

The associated Pelham, Ocilla, and Ellabelle soils all have poor drainage with surface layers of dark gray to black loamy sands up to a foot in depth. These generally underlain by dark-gray to gray sandy clay loams (Wilkes et al. 1974:9).

Climate and Health

The climate of this section of the Atlantic Coastal Plain province may be classified as humid and subtropical. Most of the air masses which reach Savannah are continental, having been chilled in winder and heated in summer, before ever reaching the City. Because of these continental air masses the seasons change rather abruptly. During intervening periods, however, the weather may be tempered by air from the Atlantic Ocean. The temperature ranges from cold in the winter (with frequent periods of striking warmth) to hot in the summer (with the climate made more uncomfortable by the high relative humidities). The growing season is about 273 days, more than sufficient for a wide range of plants.

The average annual precipitation is 45 inches, with a prominent summer peak and reduced amounts in the winter. This rainfall pattern, however, is subject to tremendous variation — often the wettest year has twice the rainfall as the driest and droughts have been known to cause serious water shortages. DeBraham notes that 1760 was "a Season remarkable for extraordinary Drought" (DeVorsey 1971:152).

This weather pattern has traditionally affected the healthfulness of the Savannah area. DeBraham remarked that:

> The City of Savannah continued from its first Settlement, for near 30 years to be accounted a very healthy Place. The South Carolinians used to come there for recruiting their Health (DeVorsey 1971:160).

However, as soon as Hutchinson's Island and the swamps surrounding Savannah were converted to rice cultivation:

> the Vapours handing upon them . . . rolled in . . . and all the Streets and Houses filled with them, to the Prejudice of its Inhabitants, whose Diseases are in every respect similar to those in the Neighboring Province of South Carolina (DeVorsey 1971:160).

Savannah suffered outbreaks of yellow fever in 1801, 1807, 1808, 1817, 1818, 1819, 1821, 1827, 1831, 1839, 1850, 1852, 1853, and 1854. The most severe, however, was the last epidemics was in 1876 with perhaps 10,000 cases at nearly 1100 deaths. The community began to understand the climatic events that promoted yellow fever, even if they did not yet comprehend the role of the mosquito:

> In 1820, 1854, and I add 1876, when yellow fever raged here as a general epidemic, *a very peculiar and almost identical condition of the atmosphere . . . existed*; that is, each of these epidemics was preceded by a mild winter, an early spring, with a rainfall sufficient to fill the ponds, swamps, and low grounds surrounding the city, with stagnant water, and finally, with the intensely hot and oppressive month of July. From September 6th to October 6th the epidemic

> raged with terrific violence. At this latter date, the temperature lowered (mean 61°), a change occurred in the direction of the wind (N.E.), and new cases gradually decreased in number but the epidemic did not entirely disappear until the occurrence of a light frost on the 14th of November" (Dr. J.C. De Hardy quoted in Usinger 1944:149).

These frequent outbreaks, coupled with "ague," "remittent fever," or "billious fever," now known as malaria (Meade 1980), were enough to encourage Savannah to remove the wet culture of rice from the outskirts of the city (Gamble 1901:145).

Richard H. Haunton, in his discussion of Savannah a decade before the Civil War, remarked that:

> to the problems of a semi-tropical climate were added those common to an urban environment in an age of primitive sanitation facilities. Trash and litter were thrown into the City's streets and lanes, which, said the *Georgian* in 1857, were "in a condition fit to be classed among the dirtiest and most unwholesome thoroughfares in the South." "Offal and other putrying matter" lay exposed on the outskirts of town. The City's privies, inadequately ventilated and infrequently cleaned, presented the most serious problem to the health authorities (Haunton 1968:283).

Hardee (n.d.:127) reports that "in almost all private houses of any importance there was a well" during the colonial and early antebellum periods. These water sources, often no deeper than 16 feet, were frequently contaminated with privy seepage or overflows. In 1854 Savannah's first waterworks began supplying water from the Savannah River, via Musgrove Creek on the western side of the city. The settling and filtering ponds were, in fact, situated just west of the S&O Canal). In 1887 the city switched to artesian wells, significantly improving the quality of the potable water supply (Hardee n.d.:47).

Floristics

Francis Moore, traveling through Savannah in 1735, left one of the few early accounts of the region's natural vegetation, noting that in the Trustee's Garden just east of the City was a stand of:

> old wood, as it was before the arrival of the colony here. The trees in the grove are mostly bay, sassafras, evergreen oak, pellitory [prickly ash, also known as the toothache tree] hickory, American Ash, and the laurel tulip (Moore 1840:I:n.p.).

This natural vegetation, however, had been almost totally cleared away by Oglethorpe's original settlers. In its place were introduced a broad range of exotic plants, such as lemons and olives. Alice G.B. Lockwood observes that the settlers were still struggling, in 1742, "with the culture of such fruits as oranges and 'limmons,' loath to believe that they could not raise them here as well as they could in the same latitude on the other side of the world" (Lockwood 1934:II:272). In spite of the problems, DeBraham noted thriving "two large Olive Trees, some Sevil Orange, Apple, Plumb, Peach, Mulberry, honey Locust, one Apricot, and one Amerel Cherry Tree" upwards of a decade after abandonment (DeVorsey 1971:155).

Visitors to Savannah during the early nineteenth century were greeted with unpaved streets, many of which were covered in grass (1819 account by Adam Hodgson, quoted in Lockwood 1934:II:275). By 1829 a visitor noted the presence of "groves of trees planted in the streets." In particular:

> In all the streets and squares of Savannah, most of which are very tastefully laid out, numerous rows of Pride-of-India trees [China-

> Berry] have been planted, which serve to shade the walks, and give a tropical air to the scene (1827 account by Captain Basil Hall, quoted in Lockwood 1934:II:275).

Yet another visitor to Savannah, in 1833, remarked that "its streets are planted so thick with Pride-of-China that the small dark houses are hardly seen," while an 1829 visitor, Charles Joseph Latrobe, remarked that:

> the broad rectangular streets are lined with luxuriant Melia [China-Berry] and Locust-trees, and there are frequent open squares with grass-plots" (quoted in Lockwood 1934:II:275).

While all of these accounts emphasize the regularity and beauty of Savannah, it is likely that as an urban environment the town as possessed its "seedier" side. It is also certain that Savannah's biotic community was largely shaped by the intentional (i.e., garden planning and deforestation) and unintentional (i.e., fires) actions of its inhabitants. Both, however, created an unnatural, disturbed environment open to plants typically called "weeds," many of which are stenotrophic and thrive on enriched (or polluted) conditions.

Outside of the town core, something approaching a rural setting was quickly encountered. In the early nineteenth century Savannah's west side was abutted by Vale Royal and Springfield Plantations, both characterized by low, poorly drained lands. Vegetation inland from the Savannah River edge in this area was likely that of a lowland broadleaf evergreen forest. Common trees would have been water oak, live oak, laurel oak, southern magnolia, pignut hickory, white oak, American holly, and spruce pine, with an understory of saw palmetto, sparkelberry, and swamp palm. Such areas also contain mesic hammocks, some of which are intermediate between the higher portions of the floodplains and the more xeric upland pine forests. These hammocks may contain willow oak, sweet gum, and red bay (see Wharton 1977).

Today, the project area is dominated by the urban setting. Vegetation consists of lawn grass, occasional "weeds," and second-growth hardwood scrub surviving in woodlots and on abandoned tracts.

PREHISTORIC AND HISTORIC OVERVIEW

Previous Work

As might be expected, the City of Savannah is dotted by archaeological sites and, in the urban environment, many of these sites encompass entire blocks or rather amorphous areas. Only two archaeological sites, however, are reported for the immediate vicinity of the project corridor, based on our consultation with the Georgia Archaeological Site Files.

Site 9CH703 is situated immediately east of Station 20+00 in the block bounded by Turner Street to the north, Martin Luther King Jr. Boulevard to the east, Louisville Road to the south, and W. Boundary Street to the west. The central UTM coordinates are listed as E490480 N3548650 and the site is described by Dr. Larry Babbits as:

> a Revolutionary War battlefield, then occupied by Central of Georgia RR as a major base of operations (roundhouse, shops, etc.). Now being developed as a visitor's center, park and shopping mall with condominiums. Heavy filling occurred during 1840 and later to create a level grade for RR usage (9CH703 site form, on file, Georgia Archaeological Site File).

As part of the Olympic Beautification Project, archaeological survey was conducted in a number of the City's median strips and one archaeological site, 9CH795, was recorded on Oglethorpe Avenue West (central UTM coordinates of E490600 N3548600). Small quantities of historic materials were countered in the area of the Oglethorpe median running from East Boundary Street eastward to Jefferson Street (9CH795 site form, on file, Georgia Archaeological Site File). This area is immediately east of Station 14+50.

Neither of these sites appears to be associated with the project area and no materials from either site were encountered during the current survey.

There are, in addition, three National Register sites within the immediate project boundaries. The Springfield and Ogeechee (S&O) Canal itself is listed on the National Register, listed in April 1997 and consisting of three contributing sites and 15 contributing structures. Within the survey area features of special importance are the canal, running from Station 13+00 where the project begins to Station 41+00, at Gays or Lock Number 2, where the corridor leaves the S&O Canal and begins following the Springfield Canal and Gays or Lock Number 2, which allowed the S&O Canal to pass over the Springfield Canal. Built between 1826 and 1830, this canal linked the Ogeechee interior with the port of Savannah. This canal and its features will be more fully discussed in the historical overview following later in this section.

Also listed on the National Register are two brick viaducts included in the Central of Georgia Railroad: Savannah Shops and Terminal Facilities nomination, which was listed in 1978. Of special importance are the Main Line and Dooley Yard Viaducts, built in 1853 and 1860 respectively. These brick viaducts, sometimes referred to as trestles, are elaborately constructed, passing over not only the S&O Canal, but also West Boundary Street. These are encountered at stations 21+00 and 24+70. They will be discussed in a following section.

A third National Register listed property is Laurel Grove South Cemetery. Listed in 1978, this cemetery was begun in 1852 as a fifteen acre section devoted to the burial of Savannah's "free persons of color and slaves." The land was the

furthest from the City and also the lowest of the Laurel Grove tract. The Springfield Canal cuts through a corner of the cemetery and this area will also be discussed in greater detail in a following section.

In 1984 Dr. Chester DePratter and Mr. Roy Doyon, then with Southeastern Archaeological Services, conducted an investigation of portions of the S&O and Springfield canals as part of an Army Corps project (DePratter and Doyon 1984). The 4.7 mile-long survey began at the Savannah River, under the Talmadge Bridge and continued southward past the Laurel Grove Cemetery. The study involved historic research, as well as field investigations conducted during the winter and primarily at low tide. An area of 100 feet on either side of the Canal was included in the survey and "a limited number of posthole tests were excavated in a search for buried sites." DePratter and Doyon, however, found that:

> recent fill along much of the canal prevented discovery of such sites. Post hole testing was determined to be of no use in site discovery operations, and was thus discontinued after several tests provided no useful information (DePratter and Doyon 1984:29).

Although the study does not specify how many tests were dug, or their locations, they do indicate that no prehistoric sites were found, attributing this to the very low, wet soils through which the canal was excavated. They instead focus on identifying features associated with historic developments in the area.

Specifically, they comment on a number of features that *might* be impacted by widening or channelization of the canal. Gays or Lock Number 2 is noted to be "partially preserved. A section of the three arched conduits which carried the Springfield Canal beneath the lock was reported as still intact. In addition, "the eastern end of the lock and a portion of the retaining walls are also present, but not well preserved" (DePratter and Doyon 1984:34).

They also comment on the two brick viaducts of the Central of Georgia Railroad, although they note that "the numerous other bridges that cross this segment of the canal are recent in origin and have little or no historical or architectural significance" (DePratter and Doyon 1984:37).

They note that the canal passes through the southwestern corner of Laurel Grove South Cemetery and caution that any work on the canal might encounter burials. This was apparently based on the black cemetery keeper, in 1890, complaining that the graveyard was insufficiently drained causing burials to be shallow. In addition, since the area had already been used for 40 years, it was overcrowded and "when an interment takes place one or more coffins are disturbed" (Mayor's Annual Report 1890:130, quoted in DePratter and Doyon 1984:28). They do not, however, report finding any evidence of graves in the corridor of the canal during their survey.

Also reported are sections of wooden bulkhead on the west side of the canal between Louisville Road and Bay Street, one of which is illustrated at low tide (DePratter and Doyon 1984:Figure 9a). Unfortunately, they do not specify exactly where any of these bulkhead sections were located.

Prehistoric Synopsis

Overviews for Georgia's prehistory, while of differing lengths and complexity, are available in virtually every compliance report prepared for the region. There are, in addition, some "classic" sources well worth attention, such as Williams' edited works of Antonio J. Waring, Jr. (Williams 1968).

These can be supplemented with a broad range of theses and dissertations, such as Lewis Larson's examination of coastal subsistence technology (Larson 1969), Chester DePratter's discussion of Georgia chiefdoms (DePratter 1983), or Morgan Crook's examination of Mississippian community organization along the coast (Crook 1978).

Also extremely helpful, perhaps even essential, are a handful of recent local synthetic statements, such as that offered by Sassaman and Anderson (1994) for the Middle and Late Archaic and Anderson et al. (1992) for the Paleoindian. Only a few of the many sources are included in this study, but they should be adequate to give the reader a "feel" for the area and help establish a context for the various sites identified in the current study. For those desiring a more general synthesis, perhaps the most readable and well balanced is that offered by Judith Bense (1994), *Archaeology of the Southeastern United States:* Paleoindian to World War I. Figure 3 offers a generalized view of Georgia's cultural periods.

Paleoindian Period

The Paleoindian Period, most commonly dated from about 12,000 to 10,000 B.P., is evidenced by basally thinned, side-notch projectile points; fluted, lanceolate projectile points; side scrapers and end scrapers; and drills (Coe 1964; Michie 1977; Williams 1968). Some even suggest pushing the beginning date to as early as 14,000 B.P. (Oliver 1981). Non-fluted points such as the Hardaway Side-Notched and Palmer Corner-Notched types, usually accepted as Early Archaic, are occasional seen as representatives of the terminal phase of the Paleoindian Period.

The Paleoindian occupation, while widespread, does not appear to have been intensive. Artifacts are most frequently found along major river drainages, which Michie interprets to support the concept of an economy "oriented toward the exploitation of now extinct mega-fauna" (Michie 1977:124). Survey data for Paleoindian tools, most notably fluted points, is rather sparse for Georgia (Ledbetter et al. 1992). In spite of this, the distribution offered by Anderson (1992:Figure 5.1) reveals a rather general, and widespread, occurrence throughout the region. The recognition of Paleoindian sites in Georgia is hindered not only by a lack of research, but also by the small size of typical sites (often the Paleoindian component may be recognized by a single tool) and the heavy amount of reworking and curation seen in Paleoindian tools from Georgia (Ledbetter et al. 1992:261).

Distinctive projectile points include lanceolates such as Clovis, Dalton, Suwannee, and perhaps the Hardaway (Anderson 1990:7-9). During the later portion of the Paleoindian, many researchers (see Snow 1977:3-4, Figure 1 for example) borrow from Florida and suggest that these more classic large lanceolate points were replaced by smaller points with concave bases, such as the Tallahassee, Sante Fe, and Beaver Lake (Bullen 1975:45-47; Milanich and Fairbanks 1980:45). In addition, points such as the Bolen Plain and Bolen Beveled (Bullen 1975:44, 49-53; Milanich and Fairbanks 1980:45) are thought to be intermediate between the Late Paleoindian and Early Archaic in much the same way as the Palmer of South and North Carolina is regarded.

Unfortunately, relatively little is known about Paleoindian subsistence strategies, settlement systems, or social organization (see, however, Anderson 1992 for an excellent overview and synthesis of what is known). Generally, archaeologists agree that the Paleoindian groups were at a band level of society (see Service 1966), were nomadic, and were both hunters and foragers. While population density, based on isolated finds, is thought to have been low, Walthall suggests that toward the end of the period, "there was an increase in population density and in territoriality and that a number of new resource areas were beginning to be exploited" (Walthall 1980:30). although at least one local collector has reported early points from the general area. This near absence is attributed to the lack of readily available raw materials. Should Paleoindian materials be encountered, Georgia has developed a rather detailed preservation plan which outlines a broad range of appropriate research questions (Anderson et al. 1990).

The prevalence of Paleoindian occupation is dramatically increased, however, if Bolen and Palmer points are included. In addition, Snow comments that "large choppers, unifacial blades, and scrapers" are found in the Coastal Plain, but can be attributed to the Paleoindian Period only on the basis of their "patination; some appear chalky, and display a general likeness to Paleo-Indian material of known antiquity" (Snow 1977:3).

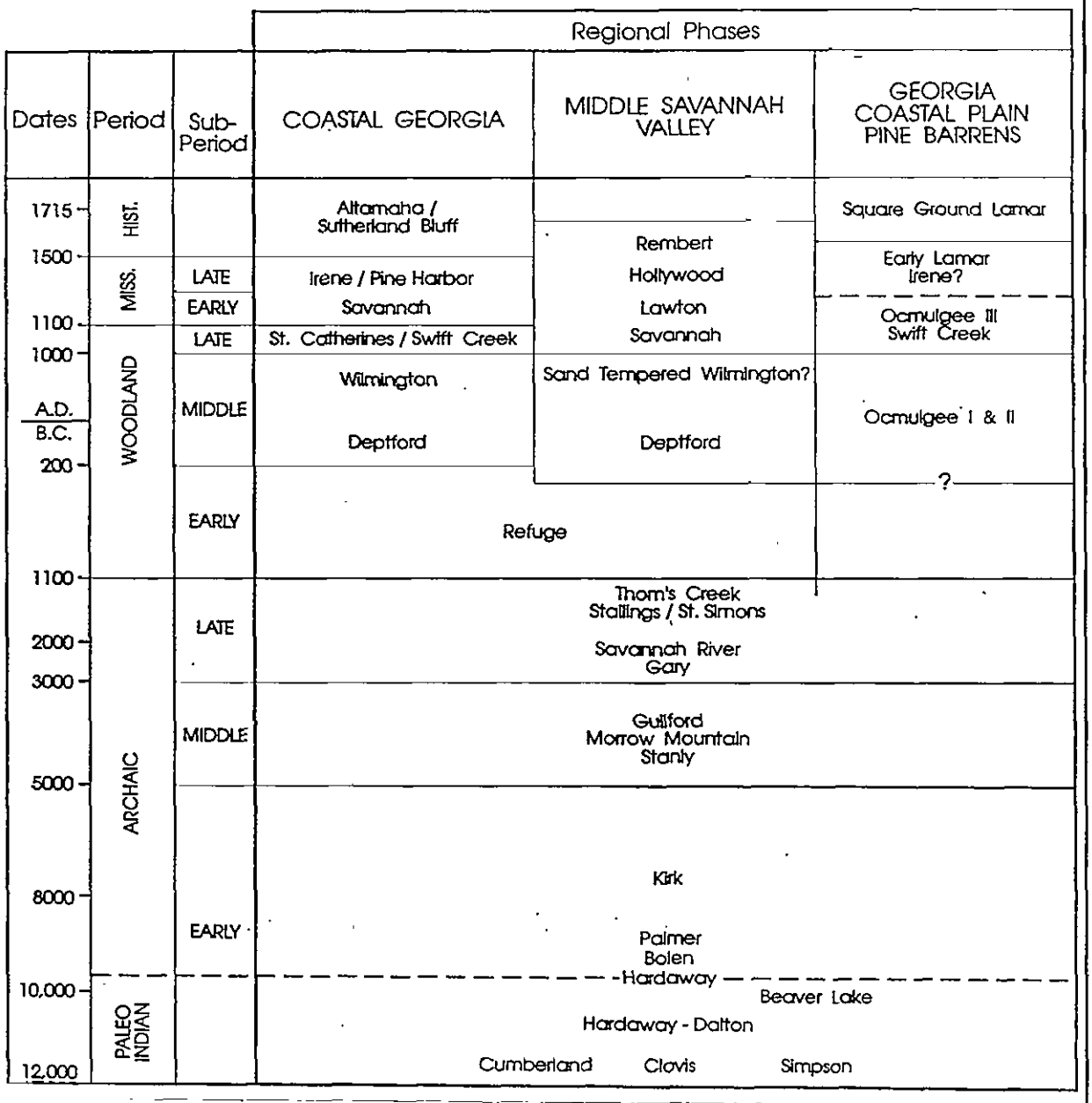

Figure 3. Cultural periods for the Georgia coastal region (adapted from Braley 1990; DePratter 1979:Table 30; Sassaman et al. 1990:Table 1).

Archaic Period

The Archaic Period, which dates from 10,000 to 3,000 B.P.[1], does not form a sharp break with the Paleoindian Period, but is a slow transition characterized by a modern climate and an increase in the diversity of material culture. Associated with this is a reliance on a broad spectrum of small mammals, although the white tailed deer was likely the most commonly exploited animal. Archaic period assemblages, exemplified by corner-notched and broad-stemmed projectile points, are fairly common, perhaps because the swamps and drainages offered especially attractive ecotones.

Diagnostic Early Archaic artifacts include the Kirk Corner Notched point. As previously discussed, Palmer and Bolen points may be included with either the Paleoindian or Archaic period, depending on theoretical perspective. As the climate became hotter and drier than the previous Paleoindian period, resulting in vegetational changes, it also affected settlement patterning as evidenced by a long-term Kirk phase midden deposit at the Hardaway site (Coe 1964:60). This is believed to have been the result of a change in subsistence strategies. Other hallmarks of the Early Archaic are often considered to include a continued reliance on high quality lithic raw materials, a highly curated tool kit, high geographic mobility, and periodic aggregation of band-sized groups (see Daniel 1996).

Settlements during the Early Archaic suggest the presence of a few very large, and apparently intensively occupied, sites which can best be considered base camps. Hardaway might be one such site. In addition, there were numerous small sites which produce only a few artifacts – these are the "network of tracks" mentioned by Ward (1983:65). The base camps produce a wide range of artifact types and raw materials which has suggested to many researchers long-term, perhaps seasonal or multi-seasonal, occupation. In contrast, the smaller sites may be thought of as special purpose or foraging sites.

There are several intensively occupied Early Archaic sites which are of special importance in our understanding of this period, including the Lewis East and Pen Point sites in South Carolina (for a review, see Sassaman and Anderson 1994:84-85) and the Taylor Hill site in Georgia (Elliott and Doyon 1981).

Middle Archaic (8,000 to 6,000 B.P.) diagnostic artifacts include Morrow Mountain, Guilford, Halifax and Stanly projectile points. Ledbetter remarks that a possible regional variant includes the side-notched or corner-notched points similar to Halifax, as well as an elongated point known as the Brier Creek Lanceloate (Ledbetter 1995:12; Sassaman and Anderson 1994:27). Also observed during this period is the MALA (Middle Archaic-Late Archaic) point, which are typically made from heat-treated chert and considered by some to be a regional variant of the Benton type (see Sassaman 1985; see also Sassaman and Anderson 1994:27-29 for a more updated discussion).

Much of our best information on the Middle Archaic comes from sites investigated west of the Appalachian Mountains, such as the work by Jeff Chapman and his students in the Little Tennessee River Valley (for a general overview see Chapman 1977, 1985a, 1985b). Closer to Georgia,

[1] The terminal point for the Archaic is no clearer than that for the Paleoindian and many researchers suggest a terminal date of 4,000 B.P. rather than 3,000 B.P. There is also the question of whether ceramics, such as the fiber-tempered Stallings ware, will be included as Archaic, or will be included with the Woodland. Oliver, for example, argues that the inclusion of ceramics with Late Archaic attributes "complicates and confuses classification and interpretation needlessly" (Oliver 1981:20). He comments that according to the original definition of the Archaic, it "represents a preceramic horizon" and that "the presence of ceramics provides a convenient marker for separation of the Archaic and Woodland periods (Oliver 1981:21). Others would counter that such an approach ignores cultural continuity and forces an artificial, and perhaps unrealistic, separation. Sassaman and Anderson (1994:38-44), for example, include Stallings and Thom's Creek wares in their discussion of "Late Archaic Pottery."

Ledbetter (1995:12) notes that the work at Pen Point on the Savannah River, as well as work at Fort Gordon (9CB81, see Braley and Price 1991), is directly applicable.

There is good evidence that Middle Archaic lithic technologies changed dramatically. End scrappers, at times associated with Paleoindian traditions, are discontinued, raw materials tend to reflect the greater use of locally available materials, and mortars are initially introduced. Curated tools are less common. Associated with these technological changes there seem to also be some significant cultural modifications. Prepared burials begin to more commonly occur and storage pits are identified. The work at Middle Archaic river valley sites, with their evidence of a diverse floral and faunal subsistence base, seems to stand in stark contrast to Caldwell's Middle Archaic "Old Quartz Industry" of Georgia and the Carolinas, where axes, choppers, and ground and polished stone tools are very rare.

Coastal Plain settlement models for the Middle Archaic have traditionally focused on the near absence of diagnostic material. It has been suggested that the "Pine Barrens" were unattractive or could not support dense occupation. This view has been espoused by Larson (1980). As Sassaman and Anderson (1994:149) suggest, it may be that Middle Archaic groups avoided the coastal plain not because the area was impoverished, but rather because the available resources were patchy and this "patchiness" resulted in high "hidden" costs such as constant movement, increasing specialization, and the need to store larger quantities of food.

Sassaman and Anderson (1994:150-152) also briefly review the evidence supporting a focus on swamp floodplains during the Middle Archaic, noting that while such environmental settings can be difficult to identify, they do seem to be associated with large, multicomponent sites. In addition, they illustrate the mounting evidence to support seasonal rounds or seasonal transhumance between the coast and the interior (e.g., Milanich 1971).

The Late Archaic, usually dated from 6,000 to 3,000 or 4,000 B.P., is characterized by the appearance of large, square stemmed Savannah River projectile points (Coe 1964). In addition, research in the Georgia Coastal Plain suggests the presence of Gary Points, having a triangular blade, squared shoulders, a contracting stem, and a rounded or occasionally pointed base (see Smith 1978 for examples from Laurens County, Georgia). These Late Archaic people continued to intensively exploit the uplands although the Fort Stewart data appears so skewed compared to other regions, that it is difficult to understand exactly what might have been happening in this area.

One of the more debated issues of the Late Archaic is the typology of the Savannah River Stemmed and its various diminutive forms. Oliver, refining Coe's (1964) original Savannah River Stemmed type, developed a complete sequence of stemmed points that decrease uniformly in size through time (Oliver 1981, 1985). Specifically, he sees the progression from Savannah River Stemmed to Small Savannah River Stemmed to Gypsy Stemmed to Swannanoa from about 5000 B.P. to about 1,500 B.P. He also notes that the latter two forms are associated with Woodland pottery. This reconstruction is still debated with a number of archaeologists expressing concern with what they see as typological overlap and ambiguity. They point to a dearth of radiocarbon dates and good excavation contexts at the same time they express concern with the application of this typology outside the North Carolina Piedmont where it was originally developed (see, for a synopsis, Sassaman and Anderson 1990:158-162, 1994:35).

In addition to the presence of Savannah River points, the Late Archaic also witnessed the introduction of steatite vessels (see Sassaman 1993), polished and pecked stone artifacts, and grinding stones. Some also include the introduction of fiber-tempered pottery about 4000 B.P. in the Late Archaic (for a discussion see Sassaman and Anderson 1994:38-44; Sassaman 1993:16-41). This innovation is of special importance along the Georgia and South Carolina coasts.

Coupled with the presence of fiber-

tempered Stallings or St. Simons pottery (Griffin 1943; DePratter 1991:159-162) are also a broad range of worked bone and shell items, such as engraved bone pins, whelk columella beads, and antler projectiles. Coupled with these artifacts are shell rings — dough-nut shaped heaps of shells ranging from only a few feet in height to over 20 feet (see Trinkley 1985 for a general overview). There is evidence that these shell rings represent gradually formed habitation sites with occupation taking place on the rings. The sites appear to reflect permanent, year-round occupation suggesting that the coastal St. Simons and co-evil Thom's Creek (found primarily northeast of the Savannah River in South Carolina) groups were able to schedule their subsistence activities to allow stable settlements (Trinkley 1980).

There is evidence that during the Late Archaic the climate began to approximate modern climatic conditions. Rainfall increased resulting in a more lush vegetation pattern. The pollen record indicates an increase in pine which reduced the oak-hickory nut masts which previously were so widespread. This change probably affected settlement patterning since nut masts were now more isolated and concentrated. From research in the Savannah River valley near Aiken, South Carolina, Sassaman has found considerable diversity in Late Archaic site types with sites occurring in virtually every upland environmental zone. He suggests that this more complex settlement pattern evolved from an increasingly complex socio-economic system. While it is unlikely that this model can be simply transferred to the Coastal Plain of Georgia without an extensive review of site data and micro-environmental data, it does demonstrate one approach to understanding the transition from Archaic to Woodland.

Woodland Period

Sassaman (1993:55) recalls the cautions of Joseph Caldwell, who found "the regional landscape of the Early Woodland ceramic traditions" a "fascinating array of local developments and diverse extralocal influences." As a consequence, the Early Woodland becomes quickly confused and difficult to interpret.

As previously discussed, there are those who see the Woodland beginning with the introduction of pottery. Under this scenario the Early Woodland may begin as early as 4,500 B.P. and continued to about 2,300 B.P. Diagnostics would include the small variety of the Late Archaic Savannah River Stemmed point (Oliver 1985) and pottery of the Stallings, St. Simons, and (to a lesser extent) Thom's Creek series (Griffin 1943; Trinkley 1976; DePratter 1991:159-162). The fiber-tempered Stallings and St. Simons wares and the sandy paste Thom's Creek wares are decorated using punctations, jab-and-drag, and incised designs (Trinkley 1976).

Others would have the Woodland beginning about 3,000 B.P. with the introduction of the Refuge wares, also characterized by sandy paste, but often having only a plain or dentate-stamped surface (DePratter 1976, 1991:163-167; Waring 1968). There is evidence that the punctated and dentate surface decorations are gradually replaced by plain and simple stamped treatments. Sassaman et al. (1990:191) report a distribution similar to the earlier fiber-tempered and Thom's Creek wares, and suggest that the Refuge wares evolved directly from these earlier antecedents.

On the Georgia coast the Refuge has been subdivided into three subphases, with plain and dentate stamping found during the entire period. Toward the end, linear and check stamping is introduced, sometimes with grog or clay tempering. Typically these sites are found on ridges or other high, sandy ground, although DePratter also notes that many sites have been inundated by the rising sea level and are situated in the marsh (DePratter 1976:6-8).

Oelmer ceramics, which admittedly are poorly understood (DePratter 1979:177), are likely a Refuge-Deptford transition. DePratter describes the pottery's check stamping as consisting:

> of small, rhomboid or diamond checks, carefully applied to the vessel surface without overstamping. The [Oelmer] complicated stamping is somewhat unusual, consisting of

> small, carefully executed line-filled triangles, nested diamonds, and other motifs (DePratter 1979:117).

He observes that the largest sample comes from the Oelmer site and that other researchers have occasionally called the pottery Deptford Geometric Stamped. The pottery is so uncommon that it may well represent only a variety of either Refuge or Deptford.

In spite of the relative lack of detailed investigations at Early Woodland sites, it seems likely that the subsistence economy was based primarily on deer hunting and fishing, with supplemental inclusions of small mammals, birds, reptiles, and shellfish. This is based on an impression that there was a continuation of a generalized Late Archaic pattern, which may or may not be appropriate.

Somewhat more information is available for the Middle Woodland, typically given the range of about 2,500 B.P. to about 1,200 B.P. The most characteristic pottery of this time period is Deptford, although both Swift Creek and Wilmington are likely late additions. Regardless, the Middle Woodland is best understood in the context of Deptford, which has been carefully described by DePratter (1979:118-119, 123-127), who suggests two divisions with check stamping and cord marking gradually being supplemented by complicated stamping. The introduction of clay or grog tempered Wilmington wares follows on the heels of the Deptford phase.

We do not, however, mean to imply that the origin of the Middle Woodland is well understood. In fact, Sassaman takes some pains to emphasize that the transition from Refuge to Deptford is not well understood:

> the Refuge-Deptford problem is the result of numerous regional processes that converge in the Savannah River region between 3000 and 2000 B.P. The sociopolitical entities that existed on the coast and in the interior during the fourth millennium dissolved after about 2400 B.P., resulting in the dispersal of small populations across the region. . . . Pottery designs changed from highly individualistic punctation and incision to the (seemingly) anonymous use of dowels for stamping. . . . the use of a carved paddle for simple stamping should mark the "blending" of Refuge and Deptford culture, or, more accurately, reflect the subsumption of Refuge culture by the expanding Deptford complex.
>
> To complicate matters, the tradition of cord-wrapped paddles makes its way into the South Carolina area sometime after 2500 B.P. (Sassaman 1993:118-119).

The work by Milanich (1971) and Smith (1972), coupled with the considerable additional site-specific research (see, for example, DePratter 1991; Sassaman 1993:110-125; Thomas and Larsen 1979) provides an exceptional background for this particular phase. Milanich's (1971) interpretation of a coastal-estuarine settlement model with interior occupation limited to short-term extractive activities, while still useful, has been modified through the discovery of a number of interior base camps. In fact, there seems to be evidence for a number of interior seasonal or perhaps even permanent base camps, although there is as yet no convincing evidence of horticulture. Anderson (1985:48) provides a brief overview of some very significant concerns. He notes that Milanich's interpretation that the interior river valleys were used by small, residentially mobile foraging groups which dispersed from large coastal villages is clearly not correct. In fact, just the opposite appears more likely, with coastal use and settlement being seasonal (Anderson 1985:48-49).

DePratter (1979:119, 128-131; 1991) takes the position that Wilmington pottery post-dates Deptford, ushering in the use of grog or clay as a tempering material in the late Middle Woodland.

The check stamping and complicated stamped motifs found in the Deptford continue, except with clay tempering for a short time. Called Walthour, these wares are described by DePratter (1991:174-176), but they apparently existed for only a short period of time before being completely replaced by cord marking (DePratter 1979:119).

Wilmington phase sites are rather poorly understood in the Georgia Coastal Plain. No only has there been little effort to develop settlement models incorporating the Wilmington, there is very little technological research on the pottery itself. The potential importance of the Wilmington phase is perhaps evidenced by Snow's (1977) survey of the Ocmulgee Big Bend area, where large quantities of what he called "Ocmulgee I" pottery was found. He specifically states that this ware "is not Wilmington" (Snow 1977:42), noting that while there is some clay tempering (certainly not the abundant grog tempering of classic Wilmington), much of the pottery has a sandy paste (Snow 1977:36). Perhaps the most distinctive characteristic of this pottery (which is associated with at least one burial mound) is a heavy folded rim. Folded rims seem to gradually drop out, while the paste becomes increasingly more gritty in succeeding Ocmulgee II and III types.

Curiously, coupled with the coastal Wilmington material is what the W.P.A. researchers called Chatham County Cord Marked (DePratter 1991:179-180), a grit-tempered (rather than clay-tempered) heavy cord marked pottery. DePratter remarks this is possibly related to the "sand tempered" pottery that Stoltman (1974:63), further up the Savannah River, called "Wilmington."

It seems that Georgia, just like South Carolina and North Carolina, is struggling to comprehend, and deal with, a broad array of Middle Woodland cord marked pottery.

Although Deptford pottery is well recognized, the associated lithic technology is not. For Florida, Milanich and Fairbanks (1980:75-76) mention only that "medium-sized triangular" points are present. Yadkin-like triangular points are reported to be found with Wilmington sites (Anonymous 1940). Snow (1977:Figure 12) reports a broad range of small triangular points with his Ocmulgee I, II, and III cord marked pottery. The bulk of these appear to resemble more traditional Yadkin and Caraway points (Coe 1964:30-32, 49).

The Middle Woodland cannot be fully appreciated without reference to Hopewellian influences, whether the presence of coastal sand burial mounds and their evidence of status differences (e.g., Thomas and Larsen 1979) or the presence of occasional exchange goods. Sassaman et al. note that while there is a lack of "obvious" Hopewellian influence in the Savannah area, there is nevertheless evidence of a "higher order of sociopolitical complexity" (Sassaman et al. 1990:14). They note that the broad similarities in ceramic design evidence the movement of ideas, or "interprovincial integration," not seen in the Early Woodland. The presence of coastal shells found at interior sites demonstrates the movement of goods.

In some respects the Late Woodland (1,200 B.P. to 400 B.P.) may be characterized as a continuation of previous Middle Woodland cultural assemblages. While outside the Carolinas and Georgia there were major cultural changes, such as the continued development and elaboration of agriculture, the coastal South Carolina and Georgia groups settled into a lifeway not appreciably different from that observed for the previous 500-700 years. From the vantage point of Middle Savannah Valley Sassaman and his colleagues note that, "the Late Woodland is difficult to delineate typologically from its antecedent or from the subsequent Mississippian period" (Sassaman et al. 1990:14). This situation would remain unchanged until the development of the South Appalachian Mississippian complex (see Ferguson 1971). Anderson (1994:366-368) provides a basic review of the Late Woodland and Mississippian ceramic sequence at the mouth of the Savannah River. This review is particularly useful since it also compares and contrasts these developments to those in the middle and upper reaches of the Savannah (Anderson 1994:368-377).

Milanich (1971:148-149) and Caldwell (1970:91) saw the St. Catherines pottery, which seemingly characterizes the Late Woodland, as an

important aspect in the gradual progression from Deptford to Wilmington to St. Catherines to Savannah. Perhaps the most succinct summary of the Georgia Late Woodland St. Catherines phase is that offered by DePratter and Howard (1980:16-17). Significantly, they note that most of the Georgia data comes from burial mound excavations, "because only limited village [and presumably shell midden] excavations have been conducted" (DePratter and Howard 1980:16). Even with burials there is a limited range of artifact types — shell beads, worked whelk shell bowls or drinking cups, bone pins, and triangular projectile points. Not only is little known about village life, nothing is known concerning residential structures and there is no good evidence of agricultural crops. Once again, the Late Woodland is presented as little more than an extension of the previous Middle Woodland lifeways.

DePratter (1979:119) provides a generalized introduction to the St. Catherines phase, noting its original definition by Caldwell (1971) and remarking that the ceramics are:

> characterized by finer clay tempering than that of preceding Wilmington types and by the increased care with which the ceramics were finished. The lumpy contorted surface of Wilmington types was replaced by carefully smoothed and often burnished interiors and exteriors (DePratter 1979:119).

DePratter also notes that the temper in the St. Catherines pottery consists of "crushed sherd or crushed low-fired clay fragments" (DePratter 1979:131). One of the few studies of prehistoric temper which involved detailed chemical and petrographic analyses included a sample of six St. Catherines sherds (Donahue et al. n.d.) The study found that the trend toward decreasing grain size of the aplastic component, begun in the Middle Woodland, continues into the Late Woodland. In contrast, the grog inclusions are coarse, ranging from about 2 to 3 mm, and they contain quartz grains (perhaps reflecting the temper of the crushed sherds).

More recent investigation of St. Catherines pottery in South Carolina found that while there is considerable variability in both size and frequency of temper, there is no compelling evidence that sherds were being crushed and used as temper. The most likely explanation for the observed similarity of both paste and temper is that the temper represents dried lumps of clay which have been incorporated back into the clay during the forming of vessels. On the other hand, the same study also found that there appear to be distinct chemical differences between the paste and temper. This suggests that the dried clay used as tempering was perhaps "left-over" from earlier potting episodes (Trinkley and Adams 1994:58-60).

Although the conventional wisdom is that the St. Catherines phase drew to a close around A.D. 1150, there is mounting evidence that the phase may extend into the thirteenth or fourteenth century A.D. (see Trinkley and Adams 1994:108-110, 114-115). There may be a blurring of Middle and Late Woodland lifeways well into later periods. The resulting cultural conservativism may help explain the presence of relatively few large Late Woodland villages and the apparent absence of corn agriculture until very late along the coast.

On the coast, Hopewellian influences may be more obvious than originally thought, if the multitude of sand burial mounds being investigated by the American Museum of Natural History are as early as reported. For example, the investigations at South End Mound II on St. Catherines Island suggest the earliest burial, placed in a pit about A.D. 1000, was associated with a copper sheet, had copper earspools, and included a diabase-like pendant (Larsen and Thomas 1986:25).

Moving away from the coast and into the inner Coastal Plain there is considerably less data. It is difficult, for example, to determine how far inland St. Catherines wares are reported, or if they exist at all. Once again relying on Snow's examination of the Ocmulgee Big Bend area, there is no evidence of St. Catherines pottery. Instead, it seems that the cord marked Ocmulgee wares fill the gap. Snow even mentions that his Ocmulgee III pottery, which is found with small triangular points,

shows "some traits suggestive of closer ties with coastal Savannah II Cordmarked ceramics" (Snow 1977:43), suggesting that the Ocmulgee II wares may be Late Woodland. This may help explain why no St. Catherines sites have been found at Fort Stewart (Thomas et al. 1995:114), although clearly the lack of detailed surveys cannot be ignored.

Better known is the Swift Creek Phase, often viewed as either late Middle Woodland or Late Woodland. Swift Creek materials extend from the Gulf of Florida, where the phase was first identified (Willey 1949:378-383) into the coastal plain and piedmont of Alabama, Georgia, and South Carolina. Diagnostic artifacts include pottery with intricate, well-executed, curvilinear complicated stamped motifs. Also present are occasional suggestions of Hopewell ritual, especially among the burials. Sites include semi-permanent villages, some with burial mounds and occasionally small platform-like mounds, as well as small camps (Jefferies 1994; Keller et al. 1962; see also Sassaman et al. 1990:205-206 for a regional overview). Although there are few appropriate local studies, Snow does illustrate a number of early and late Swift Creek sherds from the Ocmulgee Big Bend area (Snow 1977:Figure 6a, 7a, 7b).

South Appalachian Mississippian

As Schnell and Wright (1993:2) observe, "Mississippian" means different things to different people — even to its earliest researchers. To Willey (1966) it meant a particular group of traits. To Griffin (1985) it meant a complex social and technological interaction sphere. To Smith (1986) it was defined as an adaptive strategy. The meaning is further distorted, or at least affected, when the issue is viewed from a strict temporal or chronological orientation, such as this presentation (since to us, the period covers the period from about A.D. 900 to A.D. 1500).

The Mississippian is viewed rather basically by Thomas et al. (1995:114). They focus on a simple coastal chronology based almost entirely on the results of excavations at Irene (Caldwell and McCann 1941) and the resulting synthesis by DePratter (1979:Table 30; 1991:183-193). In this scenario the Savannah Phase, consisting of three subphases, is followed by the Irene, broken into two subphases.

The Savannah, characterized by cord marking, is seen as developing from earlier cultures. Present are flat-topped temple mounds, although these are seen by some researchers to be less common in the Altamaha region. While the settlement system is very similar to that of the Late Woodland, there are also nucleated settlements found near estuaries and along freshwater rivers further inland. Although agriculture is seen by many as almost essential, there is no good evidence for corn or other domesticated crops.

Savannah II is distinguished by the introduction of check stamping and Savannah III is defined by the presence of complicated stamping. The Savannah III Complicated Stamped pottery is primarily curvilinear, often of concentric circles or oval motifs. Sassaman et al. (1990:207) suggest that the current temporal ranges are likely too restrictive for these subphases and suggest instead broader period of perhaps A.D. 1100 to 1200 for Savannah II and perhaps A.D. 1200 to 1300 for Savannah III.

The Savannah Phase, according to Thomas et al. (1995:117), is the best represented of any period at Fort Stewart, with 25 sites producing Savannah pottery. They also note that not only are the sites more numerous, but the collections from the sites are larger, "suggesting that the Fort Stewart/Hunter Army Airfield area was a place of intense occupation by Savannah populations" (Thomas et al. 1995:117). Most important among the Savannah sites appears to be the Lewis Mound (9BN39) and associated habitation area.

The Savannah phase gives way to what is often called the Irene Phase, probably beginning about A.D. 1300. The Irene I Phase is identified by the appearance of Irene Complicated Stamped pottery using the filfot cross and line block motifs. Not only are these motifs different from the earlier Savannah Complicated Stamped designs, but the Irene ware is characterized by grit inclusions and a coarse texture, compared to the Savannah's sandy inclusions and fine to medium-grained paste.

Also present in Irene collections are a range of rim decorations, including nodes, rosettes, and fillet appliques. Although incising is found in very low quantities during this early period, the succeeding Irene II phase is characterized by bold incising. The mouth of the Savannah River, however, was likely abandoned by the end of the Irene I Phase since little incising is found in this area.

Larson (1955) sought to distinguish his central coastal Pine Harbor incised material from the Irene wares of the northern coast. Braley (1990:98) suggests that the Pine Harbor material is both geographically and temporally distinct from Irene. He also suggests that the presence of the Pine Harbor Phase on the middle coast may help explain the apparent abandonment of the Savannah area, suggesting that the coastal groups shifted southward in order to make themselves more accessible to the interior Oconee chiefdoms (Braley 1990:99).

The situation, however, become considerably more muddled when the view is shifted inland — to the Pine Barrens in the vicinity of Fort Stewart, for example. Schnell and Wright explain that "almost nothing can be found in the literature" (Schnell and Wright 1993:41).

Using data from several Ocmulgee Big Bend sites, they note that there is a small collection of cord marked pottery, sometimes incorporated in an assemblage of plain and roughened wares, which dates from perhaps A.D. 800 to A.D. 1400 — falling within the temporal limits of the Mississippian. They note that Crook, who defined a Middle Ocmulgee Phase dating from A.D. 200 to about 900 and a Late Ocmulgee Phase from about A.D. 900 to 1600, distinguishes the two by increasing frequencies of triangular points and cord marked pottery. They also note that Crook suggests these occupations are associated with "conservative" cultural adaptations — an argument similar to that advanced for the late occurrence of St. Catherines wares along the South Carolina coast.

Snow, also exploring the Ocmulgee and Satilla river drainages, defines what he calls the Square Ground Lamar ceramic assemblage which apparently is coeval with late Irene (Snow 1990). Prior to this, the area is apparently dominated by the cord marked Ocmulgee III pottery. The Square Ground wares have 10 to 12 incised lines around the rim and below a stamp consisting of a central dot with four lines radiating out. Each of the resulting four quadrants is usually filled with chevrons (Snow 1990:Figure 5). He suggests that the "Square Ground Lamar pottery may equate with [the] Hitchiti people" of the lower Ocmulgee (Snow 1990:87).

Protohistoric and Historic Contact

The Protohistoric ceramic assemblages along the immediate coast are typically identified as Altamaha (DePratter 1979), King George (Caldwell 1943), San Marcos (Smith 1948), and Sunderland Bluff (Larson 1978). The period is often dated from about A.D. 1550 to 1700, although Green (1991:106) argues that minimally it should be extended to 1715 in order to include the Yemassee-produced pottery of South Carolina and perhaps even as late as 1763 to coincide with Smith's (1948) St. Augustine period.

Regardless of precise dating, the ware is thought to include complicated stamping (including rectilinear and curvilinear motifs), check stamping, incising, plain, burnished plain, and a red filmed ware. Green suggests a continuum from Irene to Altamaha. Vessel forms include jars, bowls, plates, and pitchers. Some include strap and loop handles as well as foot rings, clearly revealing a strong European influence. The San Marcos pottery is associated with limestone tempering, while the Altamaha and King George wares exhibit fine grit or sand.

Snow (1990:92-93) reports a dramatic decrease in the number of Altamaha sites compared to the preceding Square Ground sites in the Pine Barrens of the Ocmulgee Big Bend area. He also notes that in addition to Altamaha ceramics, there are also examples of "Miller ceramics from the Apalachee region of northwest Florida," "a smoothed-over check stamped ware, similar to Leon Check Stamped from mission sites

in north Florida" and even "Ocmulgee Check Stamped known from the Macon Plateau site." Also present are "European trade items such as glass beads and copper" (Snow 1990:93). All are representative of European contact and suggest that there was considerable movement late in the history of the region. From the historic period, Snow reports the presence of both Ocmulgee Fields, Chattahoochee Brushed, Mission Red Filmed, and Leon-Jefferson Complicated Stamped pottery — all presumably associated with Creek sites (Snow 1990:93). Unfortunately, little more than the presence of these various wares is known about the historic or contact period sites in the area.

A Brief History of the City and Project Area

By the second quarter of the eighteenth century South Carolina had risen to such economic, if not political, importance, that it was essential for its plantation and trade network to be buffered from the Spanish holdings in Florida (Coleman 1976:169-170). In addition, establishing such a buffer colony would serve the goal of making productive colonists out of the growing number of English poor urban dwellers — a major philanthropic concept which also worked to ensure at least short-term political stability in the Mother Country. Finally, the colony would establish new territory for mercantile enterprises, essential to England's economy. Consequently, George II granted a 21-year charter to the "Trustees for Establishing the Colony of Georgia," a group of prominent noblemen and political leaders (including several members of the House of Commons who succeeded in raising Parliamentary support and funding for the new colony). James Edward Oglethorpe, a young and ambitious member of Commons selected to lead the colony, was personally responsible for organizing the venture and accompanied the first 120 settlers to Georgia during the winter of 1732-33.

Oglethorpe selected Savannah, known by the Indian name of Yamacraw Bluff, as the location of the settlement. It possessed an array of essential features — close proximity to South Carolina, well drained soil, a good water supply, an excellent harbor, easy interior communication, and easy assess to coastal islands. It was also already well known to Indian traders and was defensible, should the need arise (Spalding 1977:10).

Savannah was apparently laid out using a plan developed by Oglethorpe which emphasized regularity — a universal order common to the Georgian mind-set. Central to this organization was a square, the center of the town ward, around which were four tythings and four trust lots (Figure 4). The four trust lots were initially intended to serve the "public good" and most of the early public buildings were situated on these lots. A tything consisted of 10 town lots of equal size, divided by a narrow lane providing rear lot access.

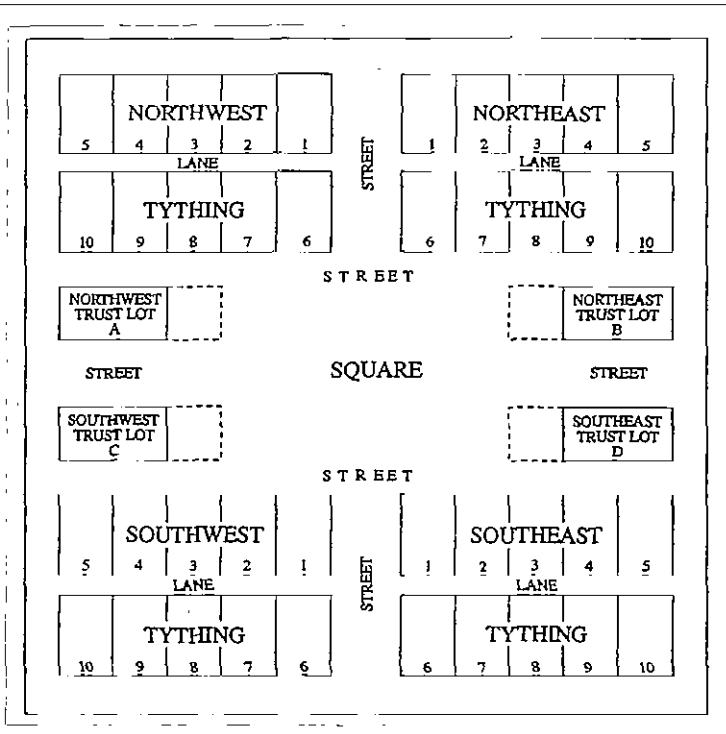

Figure 4. The basic module of Oglethorpe's Savannah plan.

Each male settler would receive:

> a town lot containing 60 feet in front, 90 feet in depth, a garden lot embracing 5 acres, and a farm containing 44 acres and 141 poles, 50 acres in all (Lockwood 1934:II:267).

By 1736 the town had begun to grow, albeit slowly. Francis Moore described the town as:

> built of wood; all of the houses of the first forty free holders are of the same size with that Mr. Oglethorpe lives in, but there are great numbers built since, I believe one hundred or one hundred and fifty; many of these are much larger, some two or three stories high . . . . the lots are fenced in with split pales; some few people have palisades of turned wooed before their doors . . . . Those who have cleared their five acre lots have made a very great profit out of them by greens, roots, and corn. Several have improved the cattle they had at first, and have now five or six tame cows (quoted in Gamble 1901:30).

By the 1750s Savannah had grown and DeBraham described its organization:

> she is laid out 2,115 by 1,425 feet square in her Bounds, this again in 24 Tidings [tythings], each of them in 10, in all 240, and 48 Trustee Lots, with six Market Places, each 315 by 270 feet square. Three broad Streets 75 feet wide, running perpendicular from the Bay, and three other 75 feet wide parallel with the Bay, centrically crossing each other, divides the City in six equal Quarters, each Quarter had four Tidings, each Tiding is run through (parallel to the Bay) by a line 22½ feet wide, each half Tiding Consists in five contiguous Lots, each Tiding as well as Trustee Lot is 60 feet in front, and 90 feet in depth. Trustee Lots are divided from each other as well as from the Tiding Lots by Streets 75 & 37½ feet wide (DeVorsey 1971:52).

This arrangement of open areas and wide streets was designed to provide adequate light and air, hopefully making Savannah a healthier location than many on the coast. It also offered the strategic advantages of a compact, defensive settlement, while the squares reduced long attack vistas. In addition, it is clear tat Utopian tendencies are also present in the identical size of the lots, equal access to "public good" lots, park areas, and granting (not selling) of lots. It was also hoped that limiting the size of land holdings would promote a large male population capable of quickly forming a large standing militia. Georgia was to be a state of yeoman farmers, not aristocratic planters. As part of this overall policy, the trustees prohibited slavery, in order to ensure self-sufficiency.

This program of development placed Georgians under a distinct economic disadvantage compared to their South Carolina neighbors just across the Savannah River. Of course it didn't help that the earliest agricultural pursuits — silk culture and wine production — were ill-conceived failures. The economy was generally stagnant and interior settlements failed to thrive. When the colony's charter was surrendered in 1752, the population was only 3,000 people (including 800 slaves).

The project area, situated on the eastern side of town, was first granted to Thomas Robinson, who was sent to the Colony in 1750-1751 "to promote the Culture of Silk in the Most effectual manner." In order to encourage his activities, he was given a stipend and a 500 acre grant. Curiously, he selected lands not adaptable to mulberry groves, but rather lands suitable for rice culture laying along Musgrove Creek. This

plantation, which he called Rawcliffe included at least 200 acres of rice land and at least 200 acres of upland soil suitable for provision crops (Savannah Unit, Georgia Writers' Project 1943:89-90).

Over the next several years Robinson continued to acquire land as the Colony continued to encourage his efforts. In March 1762, after Georgia reverted to the Crown, 1,000 acres of Rawcliffe and another tract, called Mulberry, were conveyed by the Crown to Robinson with the grant noting the tracts would be known by the name of "the Royal Vale" (Savannah Unit, Georgia Writers' Project 1943:91). These lands abutted what is today Fahm Street to the west, taking in all of what would become the S&O Canal lands from the Savannah River southward to the Augusta Highway. Robinson held his tract for only days, selling it to Lachlan McGillivray for £1,335. McGillivray, a noted Indian trader, had previously acquired a tract to the south of Vale Royal, known as Springfield. Combining these tracts, McGillivray built up his rice cultivation on Royal Vale, while farming at least portions of Springfield (Savannah Unit, Georgia Writers' Project 1943:92-93).

Under Royal "patronage" the economy of Georgia stabilized, and commercial functions began to expand into new areas. One of the most significant changes was the development of a slave-based plantation society. The city had grown to 400 dwellings by 1766 and was divided into two suburbs — to the west was Yamacraw, named for the Indians, while to the east was the Trustees' Garden, named for the lands set aside for garden lots. Coupled with this growth was Savannah's entrance into the shipping economy. By 1773 there were 25 ocean-going vessels registered to Georgians. In that year 225 vessels exported over 11,000 tons of goods from Savannah (Coleman 1976:220; Gamble 1901:33). As a result of this economic surge, Savannah saw increased architectural refinement and new building (see Honerkamp et al. 1983:24 for a review of building forms, especially on the Tything Lots).

As James Vernon McDonough observed, "Georgia revolted against England out of sympathy for the other colonies rather than because of any grievances of her own (McDonough 1950:17), indicating that politically, economically, and especially socially, Georgians held strong ties to the Mother Country. This economic and demographic interruption culminated with the British occupation of Savannah between 1779 and 1782.

During the loss of Savannah, the project area saw military action as General Robert Howe's troops retreated through the burial ground (now known as Colonial Cemetery or Park) but were fired on by British troops to the east. The American forces turned to the west, attempting to make their way down the Ogeechee Road. A number, however, headed for Musgrove Creek, in an effort to make a safe retreat out of British hands. Hitting the creek at high tide many refused to swim the water and were either killed or captured by the British. Others, in an effort to swim the creek, were drown (Gamble 1901:44; Lawrence 1952:321-322).

A map from this battle reveals that while the City continued growing along the waterfront, there was relatively little development in the vicinity of the project area (Figure 5). Parallel to the river was Indian Street, while the street projecting west from the intersection of Indian and Bay is the extension of Bay.

In September and October of 1779 Savannah was again under attack, but this time it was by American and French forces that were attempting to retake the city. After a disastrous assault, the French and Americans withdrew, leaving Savannah in the hands of the British. The battle is rather simply described by Johnson:

> Had the French marched into Savannah when they first landed, there would have been little or no resistance—had they immediately assailed the British intrenchments, when the surrender was refused, they could have been carried with ease and but little loss. But the Count concluded to give them a month for the completion of their fortifications, then attempted to

storm them, and was shamefully beaten. The whole was miserably conducted and arranged (Johnson 1851:239).

As a result, Savannah was held until the British chose to evacuate the City on July 10 and 11, 1782. The move, at that time, was largely made because the British troops were needed elsewhere, not because of any success on the part of the American troops to endanger the British forces. Some Savannah Tories easily changed sides, wanting to stay in Georgia, while others left with the British troops, finding their way to East Florida or the West Indies (Coleman 1976:86).

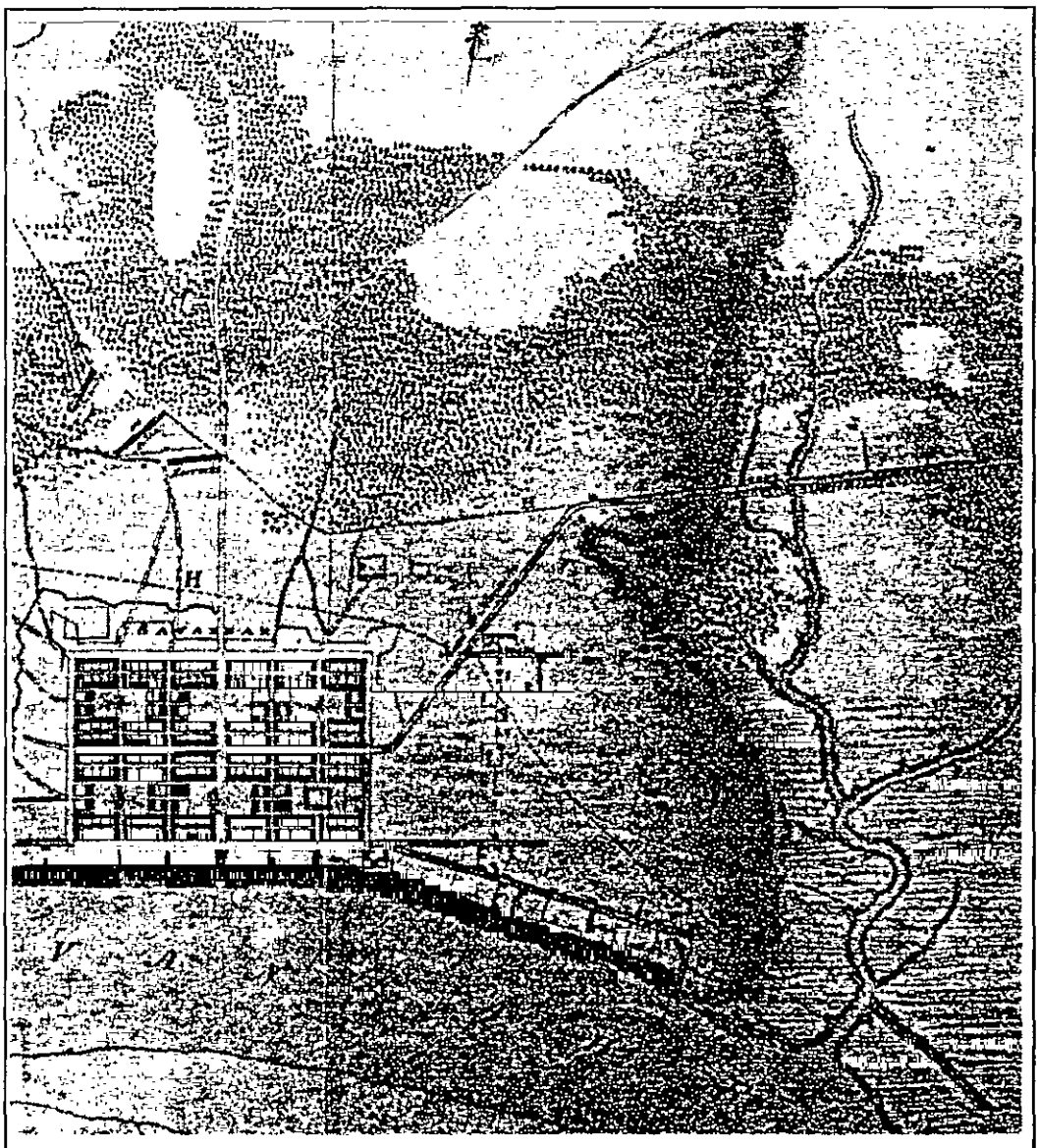

Figure 5. Portion of a 1778 map showing the Battle of Savannah (adapted from Lawrence 1952).

Savannah recovered quickly after the American Revolution and by 1800 the town had grown to 5,146 inhabitants. In spite of rather frequent outbreaks of yellow fever (see the discussions in the **Environment of the City** discussions), the town continued to grow to a population of over 22,000 by the eve of the Civil War. In spite of this prosperity, Savannah continued to be overshadowed by Charleston. Haunton (1968:2) attributes this to the lack of credit and marketing facilities in Savannah — in 1823, for example, Savannah could boast of only three banks and a

single insurance company. Savannah still obtained its water from wells, chiefly sunk in the public squares. There were no public lights and garbage was carted to the commons. During the summer scavengers were hired to haul the trash to the edge of the city. Roads were still primarily dirt and every rain caused considerable erosion not only in the streets, but also along the Savannah bluff (Gamble 1901:64). Activities in the survey corridor, however, were far from quiet.

Needing a quick infusion of cash after the Revolution, Georgia began to immediately sell off confiscated royalist lands, including the large Royal Vale and Springfield tracts of McGillivray, which had been claimed by the Whig government on April 19, 1775. The purchaser was Joseph Clay, a Savannah merchant and pay-master-general for the Southern District of the Continental Army. The name of Royal Vale was changed to Vale Royal, which was applied to both tracts. Clay built his mansion on the east bank of Musgrove Creek, apparently in the vicinity of East Bay Street, just west of Fahm Street:

> with gardens on the east and at the rear, this house, an impressive three-story building on a basement, faced westward, affording a view of the distant rice fields. It was in part to these Vale Royal rice lands that President Washington had reference when he arrived in Savannah in 1791 and wrote in his diary that the city was "surrounded with cultivated Rice Fields which have a rich and luxurious appearance" (Savannah Unit, Georgia Writers' Project 1943:97).

Joseph Clay continued the operation of the plantation until his death in 1804, at which time the lands were devised to his heirs, with Joseph Stiles, William Wallace, and Thomas Cummings appointed administrators. A division of the estate, however, was impossible given the large number of heirs who had claims on the property. Consequently, the tract was placed on the market. Described as:

> the very valuable plantation and tract of Land called Vale Royal . . . containing about 1000 acres of which 460 were tide and inland swamp, the remainder prime Cotton land"

it also included Springfield (described as "farm and garden lots") and several additional tracts (Savannah Unit, Georgia Writers' Project 1943:99-100).

In 1806 Springfield was sold to Ralph Clay and Vale Royal was sold to Benjamin Maurice. Maurice's lands were quit-claimed to Joseph Stiles and apparently Clay's purchase was also conveyed to Stiles — both apparently working to help Stiles avoid the legal rules precluding an administrator from becoming a purchaser at his own sale.

Stiles worked diligently to make his new tracts profitable. Although he planted cotton, it has been suggested that he thought rice cultivation was far more profitable. The 1812 Houstoun map (Figure 6) shows the rice fields of Vale Royal, as well as Musgrove Creek. At the end of a causeway to the creek is a rice mill and on the opposite shore are cotton fields. This map reveals that the project area north of Louisville Road runs entirely in an area which originally was diked for rice cultivation.

Just as Stiles began to see a profit, the City of Savannah intervened, announcing in 1817 their intention to prohibit "wet and water culture" within 3 miles of the city. This move, at the cost of about $14 per person in the City (to compensate owners of rice lands) was taken to increase the healthfulness of the city (Meade 1980:82; see also Harden 1981:365-366). Gamble notes that the law, while having an almost immediate impact on the number of deaths and illnesses, was far from widely applauded. Stiles agreed to limit his rice cultivation, shifting efforts to brick making and cotton. He continued to operate his rice mills and apparently did not take any real steps to drain his lands. In fact, there is some indication that he continued to grow rice on dry culture lands.

Figure 6. Portion of the 1812 Houstoun *Map of the City of Savannah* showing the project area along the edge of the Vale Royal rice fields.

Eventually the Savannah action to limit wet culture found its way into the Courts, which ruled against the city. In 1830 the city petitioned the State Legislate to pass a bill allowing them to stop the cultivation of rice within their limits. Gamble notes that:

> the law was especially desired to reach the Springfield plantation, owned by Mr. Stiles, with whom the City was continually at loggerheads over his dry culture contracts, until finally in 1834 suits against him succeeded in fully establishing the sufficiency of the contracts (Gamble 1901:146).

Stiles apparently made some effort to begin draining his fields and several maps of the period show "Stiles Canal" following the course of the present Springfield Canal. Stiles died in 1838 leaving Vale Royal to one set of his children and Springfield to another. Neither group did much with their inheritance, both because of extensive indebtedness against the property and because of the various limitations on the use of the land. It seems that they found subdivision and land sales were far more profitable than agriculture (Savannah Unit, Georgia Writers' Project 1943:104-105).

In April 1850 an agreement was worked out between the Stiles heirs and the City of Savannah to purchase all 960 acres of Springfield Plantation. Gamble notes that:

> a large canal was ordered dug to drain the low lands and the plantation was divided into lots, appraised and offered for sale except the high land. This the committee recommended should be laid out for a cemetery, and that families having dead in the old cemetery should be given lots free in the new cemetery on the condition that they removed their dead there,[2] the other cemetery lots being sold a nominal cost (Gamble 1901:205).

The large canal that Gamble mentions was, of course Springfield Canal, linking up with the portion already excavated and called Stiles Canal. Through time, parts of this canal were also known as Minis Canal, again for the property owner through which it flowed.

Prior to this, however, portions of the project area were dramatically altered by the construction of the Savannah and Ogeechee (S&O) Canal. The need for the canal was intimately linked with the expansion of Georgia, including the lotteries for land ceded by Native Americans. As the state grew, so too did the reliance on waterways for transport of good and crops.

In 1824 Ebenezer Jenckes was granted a charter by the State Legislature for the proposed Savannah and Ogeechee (S&O) Canal, culminating at least four years of planning and efforts to raise the necessary funds (see DePratter and Doyon 1984:11). The National Register form for the S&O Canal explains:

> The Savannah and Ogeechee Canal was built during the brief era of "internal improvements" in Georgia, part of a national movement, and it was boldly envisioned as part of a vast canal system that link the Savannah, Ogeechee, and Altamaha rivers along the coast with the Flint and Chattachoochee rivers and the Gulf of Mexico to the west. Little if any of this vast network ever was built, however. More realistically, the canal was intended to preserve Savannah's hegemony as Georgia's principal

[2] There was growing concern that the "old cemetery" at the corner of Abercorn and Oglethorpe was not only unhealthy and full, but was also in poor condition.

> port by siphoning off Ogeechee River traffic which might otherwise have gone to Darian or Brunswick, and at this it succeeded (Hendricks and Spoolstra 1997: n.p.)

Jenckes traveled to New York to meet with DeWitt Clinton, governor of New York and the Erie Canal's champion. Governor Clinton recommended his twenty-year old son, DeWitt Clinton, Jr., to design the canal. Although hired by Jenckes, Clinton faced a number of challenges to his authority in Savannah and many of his recommendations were ignored. The canal almost immediately encountered funding problems and in March 1827 Clinton unexpectedly resigned, to be replaced by the assistant engineer, Edward Hall Gill. Gill remained only a year, replaced in 1828 by Loring Olmstead Reynolds (Hendricks and Spoolstra 1997:n.p.).

Costs continued to rise and the canal company went through several reorganizations. Local landowners were used as subcontractors and so reaped an immediate return, being paid for the labor of their slaves.

The canal was completed in 1830, with the canal being 48 feet wide at the top, 33 feet wide at the base, and 5 feet in depth. In some areas the canal was built entirely or partially above the ground level, being confined by the earthen embankments. In other areas it was built at grade, resembling a broad ditch. The right of way was typically 120 feet or 60 feet on either side of the center line. But, the canal's problems were not over. Shoddy construction caused repeated failures of locks and embankments. Creditors demanded returns on their investments, and the Savannah community began referring to it as "the Folly." The final crushing blow was railroad fever, which siphoned off investors. In 1836 the canal was bankrupt and was sold at a sheriff's sale.

The new management replaced wooded locks with brick ones, deepened the channel, and reworked the embankments to widen the tow path. By the early 1840s the canal was beginning to be a recognized economic asset. William Harden described the improvements:

> the locks are all of brick 140 feet long, 18 feet wide, except the lock at the Savannah River, which is 30 feet wide, and will admit a vessel of 10 feet water — the Canal from the lock to the Rail Road bridge is 160 feet wide, and with a little deepening a vessel drawing 10 feet water can pass up to the Rail Road bridge . . . . The present Company have reduced the tools, and they design to make it the interest of the public to use the Canal (Harden 1981:391).

The canal remained operational for most of the Civil War. As Sherman made his advances on Savannah, the S&O was not only the scene of several skirmishes, but was also extensively damaged (Hendricks and Spoolstra 1997:n.p.). Nevertheless, but 1866 the canal was once again in operation and by 1876 it was noted that the canal was "paying property and very useful to the city of Savannah" (Janes 1876:178). In 1888 the canal was purchased by the Central of Georgia Railway which suspended canal traffic and used the canal basin at the Savannah end for its Ocean Steamship Company. Portions of the river lock were removed, the canal was deepened, and the basin was extended to create a boat dock (although most of these activities were outside the project area).

By the twentieth century the canal was largely abandoned, with many areas being filled in for housing or road projects. In 1933 WPA cres drained portions of the canal, constructed a previously documented floodgate (see Trinkley 1996) and connected the S&O to the Springfield Canal as part of a drainage and flood control project that is still in operation (and which has created the need for this current study) (Hendricks and Spoolstra 1997:n.p.). It was probably during this period that Gays or Lock Number 2 was filled in.

While the S&O was in operation The Central Railroad and Banking Company of

Georgia (renamed the Central of Georgia Railroad company in 1895) built a large shop complex on Savannah's west side. Construction of the company's headquarters and eastern terminus took place during the 1850s and 1860s (DeLony 1978). During this work two viaducts were constructed across the S&O Canal. The first constructed, called the Main Line Viaduct, was built in 1853 and crosses the canal immediately adjacent to the Louisville Road bridge. The second, commonly called the Dooley Yard Viaduct, was built in 1860 about 350 feet to the north.

Returning to the remainder of Stiles' Springfield Plantation purchased by the City in 1850, a contest was devised in early 1851 to solicit cemetery plans. The winning entry was by J.O. Morse, a Northern engineer in the city working on the new water plant at the edge of Musgrove Creek. Mores was also paid to survey the cemetery (which was laid out to be about 102 acres) and William George, a landscape gardener, was hired to lay out the plan. By June 1851 the cemetery was named Laurel Grove and in August a building was approved for the keeper (Gamble 1901:206).

Originally 4 acres, later increased to 15 (and eventually increased to 35 acres), were set aside for the city's black population and this portion of the cemetery came to be known as Laurel Grove South. At least some of this extension may have been made in 1877, although an additional extension was ordered again in 1881 (Gamble 1901:213).[3] Bodies from the City's potters field, the "negro cemetery," and at least some from the old cemetery (at Abercorn and Oglethorpe) were moved to Laurel Grove (Gamble 1901:207).

Several maps show many of these gradual developments over the last two decades before the Civil War. Figure 7 shows the 1840 Stephens' map revealing the S&O canal basin from the Savannah River southward to Louisville Road, where it turns to the west. The map reveals that a number of lots have already been laid out and that the rice fields of Vale Royal were largely drained and diked. In fact, the drainage of these fields and the existence of the Main Line Viaduct, suggests that the map actually dates from at least the 1850s.

The 1852 Coast Survey *Map of Savannah River from the Cross Tides to Savannah City* is firmly dated and shows that the Main Line Viaduct was already constructed (Figure 8). It also reveals the extensive drainage of the Vale Royal lands, but very little building on the lots adjacent to the canal. In fact, no structures are shown in the project area except for two on either side of the canal at the Louisville Street bridge.

The 1856 Cooper *Map of the City of Savannah* (Figure 9) seems to parallel the 1852 plan, although by this time the second, or Dooley Yard, viaduct has also been constructed by this date. This second plan does show the city's new water works, erected between the S&O and Musgrove Creek. DePratter and Doyon, reviewing the historical sources, also comment:

> Prior to the Civil War, urban activity in the lowland project area was limited for the most part to those activities associated with the Savannah and Ogeechee Canal and the Central of Georgia Railroad Yard. Low elevation and poor drainage precluded most other uses (DePratter and Doyon 1984:16).

The interruption of the Civil War and the city's occupation by Union troops did not dramatically change the project area, although it certainly worked to halt economic development. Perhaps an even greater force than Sherman was yellow fever and the epidemic of 1876 finally forced Savannah to take dramatic steps to drain the areas surrounding the city (see Usinger 1944). However, the 1871 *Bird's Eye View of the City of Savannah* (Figure 10) reveals that the project area had not changed much since the 1850s. Development was creeping toward the canal, but largely avoided the immediate area.

At this time the only portion of the Springfield Canal that had been constructed was

[3] Eventually Laurel Grove, according to Gamble (1901:386) accounted for 117.9 acres.

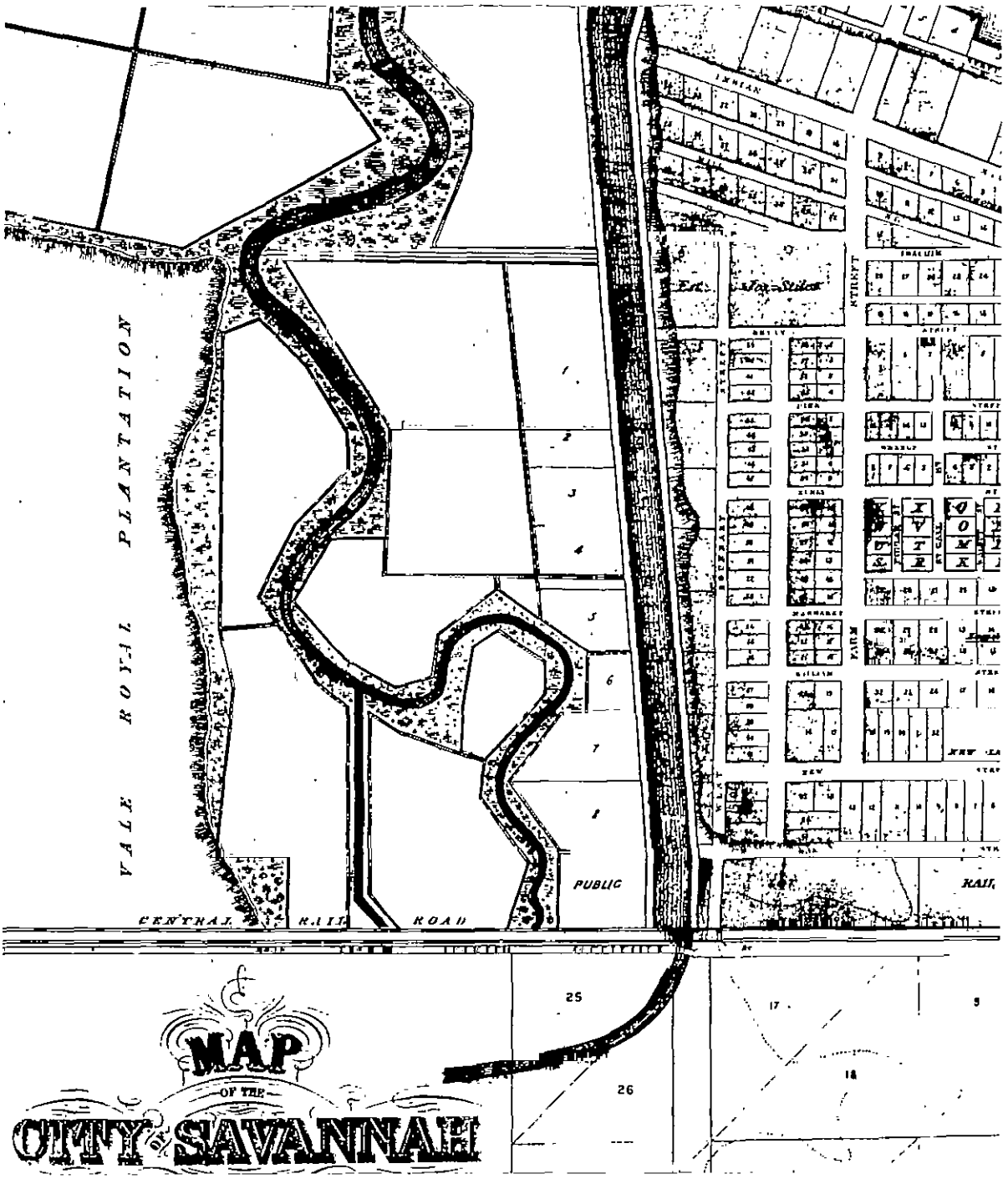

Figure 7. Portion of Stephens' *Map of the City of Savannah* dated 1840 showing the project area.

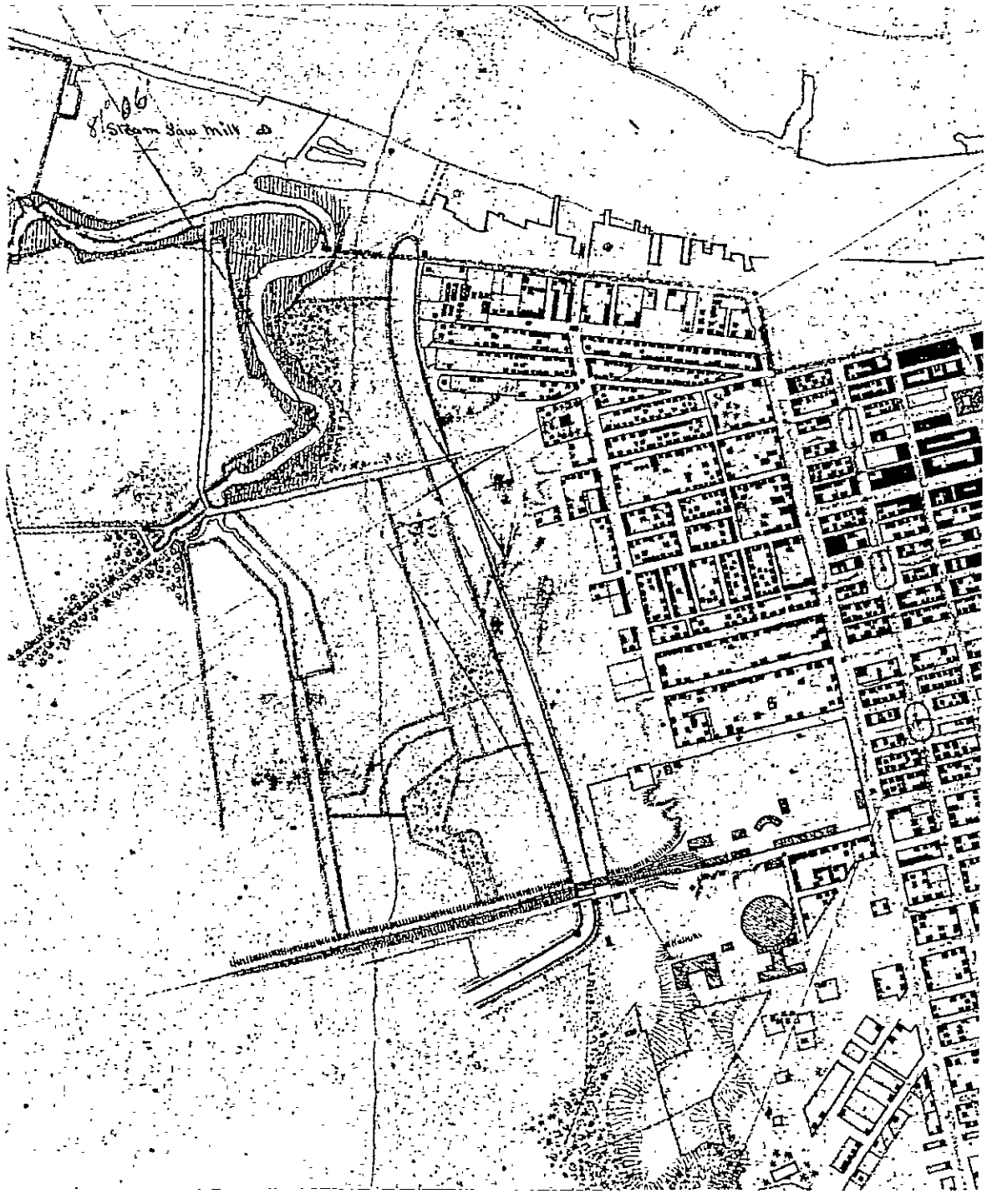

Figure 8. Portion of the 1852 Coast Survey Chart T-385, *Map of Savannah River from the Cross Tides to Savannah City*, showing the project area to south of Louisville Road.

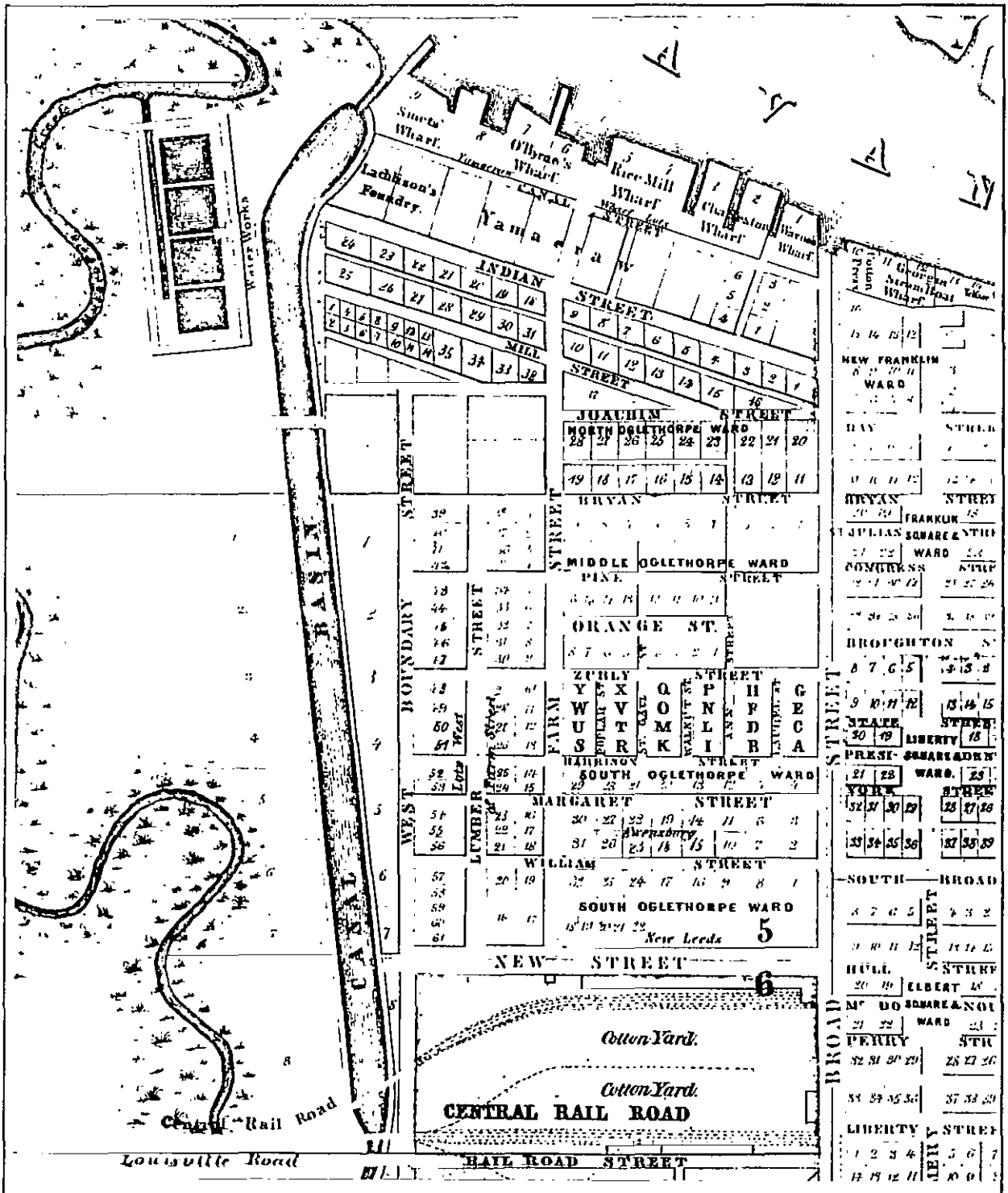

Figure 9. Portion of Cooper's *Map of the City of Savannah* from 1856 showing the project area with Stiles Canal to the west of the S&O Canal Basin.

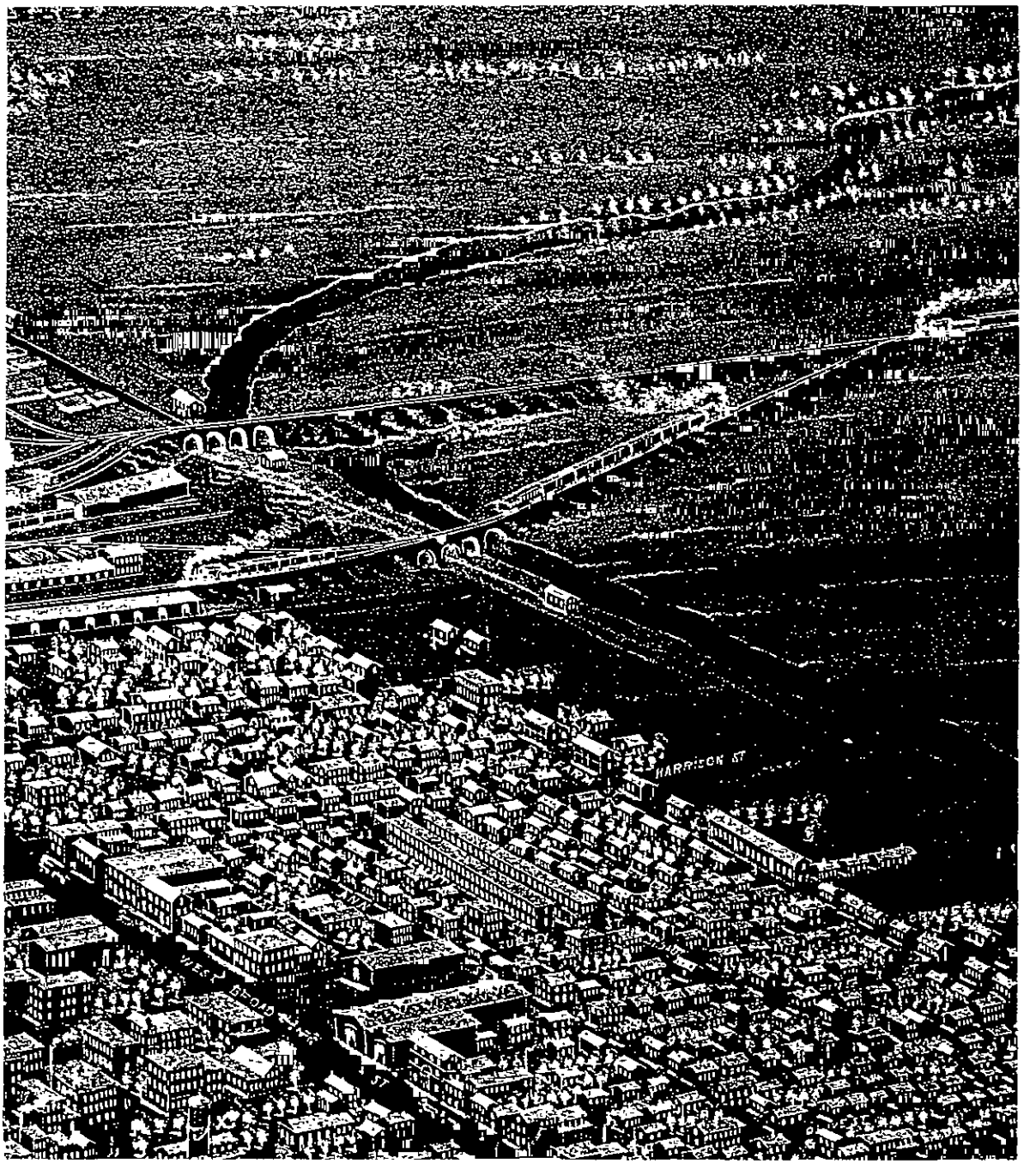

Figure 10. A portion of the 1871 *Bird's Eye View of the City of Savannah* showing limited development, even after the Civil War, around the S&O Canal.

that portion from about the present location of I-16 northward to Musgrove Creek. Constructed by Joseph Stiles at the urging of the City to drain his wet culture lands this section remained unaltered for nearly 50 years until these new efforts to drain Musgrove Creek and Springfield Plantation. Earlier attempts to deal with the problems by constructing brick and wood sewers (see DePratter and Doyon 1984:22-24) were generally unsuccessful, although considerable effort was spent digging canals and erecting floodgates.

By 1891 a report was issued on the problem (Blandford 1891) and recommendations were made to extend Stiles Canal and empty it into the S&O Canal. In fact at least some portions of this plan were already in place by 1888 (Figure 11), since this view reveals the canal was already excavated to Laurel Grove Cemetery. While not discussed by DePratter and Doyon (who contend that the Springfield Canal stopped at the Backwater Dam until after Blandford's 1891 report), it seems possible that individual property owners were constructing segments of the canal independently of government overview. This might explain why the Springfield Canal, in the vicinity of Laurel Grove, was known as the Minis Canal, after the landowner of the period just south and west of Laurel Grove.

Regardless, by the early twentieth century the efforts to tame yellow fever through drainage had just about been won. *Sholes Map of the City of Savannah* from 1900 reveals that the canal was completed, was still going under the S&O Canal, and was still emptying into the Savannah through its own system.

Coupled with these efforts, the City was also working to drain Laurel Grove (Gamble 1901:385), much of which was so wet that water frequently stood on graves and the caretaker complained that graves could often not be dug deeper than two feet. A major drainage through the cemetery was canalized, with several feeder canals excavated. Coupled with the completion of the Springfield Canal this seems to have dramatically improved the cemetery's drainage. In spite of the improved drainage, the cemetery was not expanded and instead purchased Bonaventure Cemetery (begun as a private cemetery in 1850) in 1907 (Toledano 1997:165-166). A 1961 plat reveals that drained swamp land toward the Springfield Canal (called the Minis Canal on this plan), intended for burials, was never marked out or sold (Figure 12).

The 1910 *Map of the City of Savannah* reveals that the Springfield Canal was complete and that development was beginning to overtake the newly drained Springfield lands (Figure 13). DePratter and Doyon note that the exact date that the Springfield Canal is connected to the S&O Canal isn't known, but suggest that it had occurred by at least 1945 (DePratter and Doyon 1984:26). As previously mentioned, it seems reasonable that this was undertaken as a WPA project, associated with the filling of Gays Lock Number 2 on the S&O alignment.

Development during the twentieth century was dramatic compared to that of the last half of the nineteenth century. It was, however, largely confined to industrial tracts and small, low-income housing projects. In the first quarter of the twentieth century there were a series of cotton warehouses along the west side of the canal, north of Bay Street. The Sanborn Insurance Maps from 1916 through 1944 reveal that north of the project area was Yamacraw Village, a housing project for Savannah's African-American citizens. South of this, along the banks of the canal were such businesses of C.H. Dorsett's Saw Mill, William McCrady's Wood Yard, Coastal Oil Company, J.M. Laughlin Wood Yard, and South Atlantic Packing and Provision Company. Residential activities were limited.

Even as late as 1954 development along the project area had a very similar face. Figures 14-16 show a series of Sanborn Maps of the corridor from Oglethorpe Blvd. southward to past Louisville Road. These figures make it clear that the canal was considerably narrower than when it was operating in the nineteenth century, the result of nearly 50 years of dumping and land fill activity that reduced the canal to little more than a ditch. DePratter and Doyon (1984:26) note that the canal is maintained by the Chatham County Facilities Maintenance Department, with annual

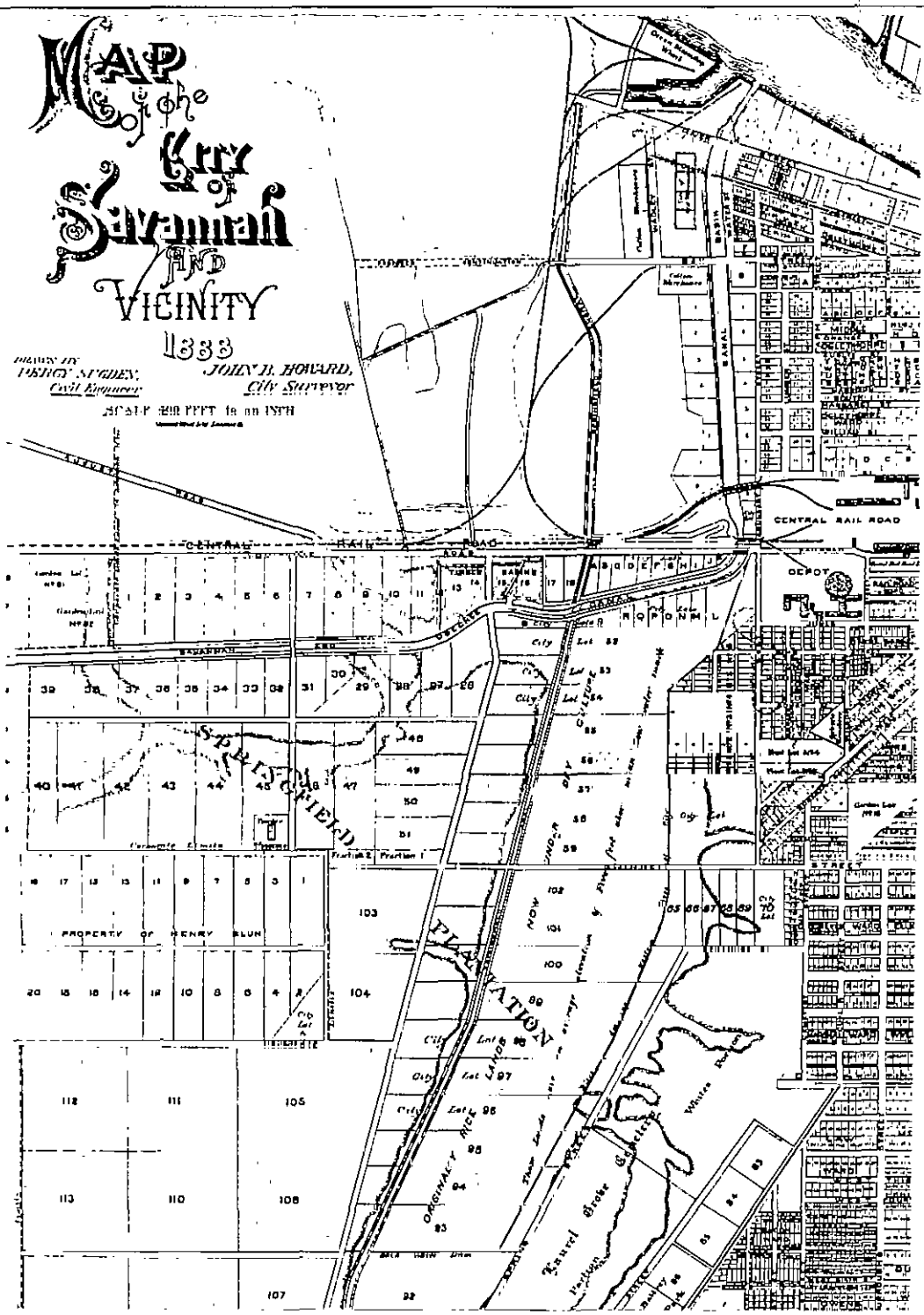

Figure 11. Portion of the 1888 Sugden and Howard *Map of the City of Savannah* showing the project area.

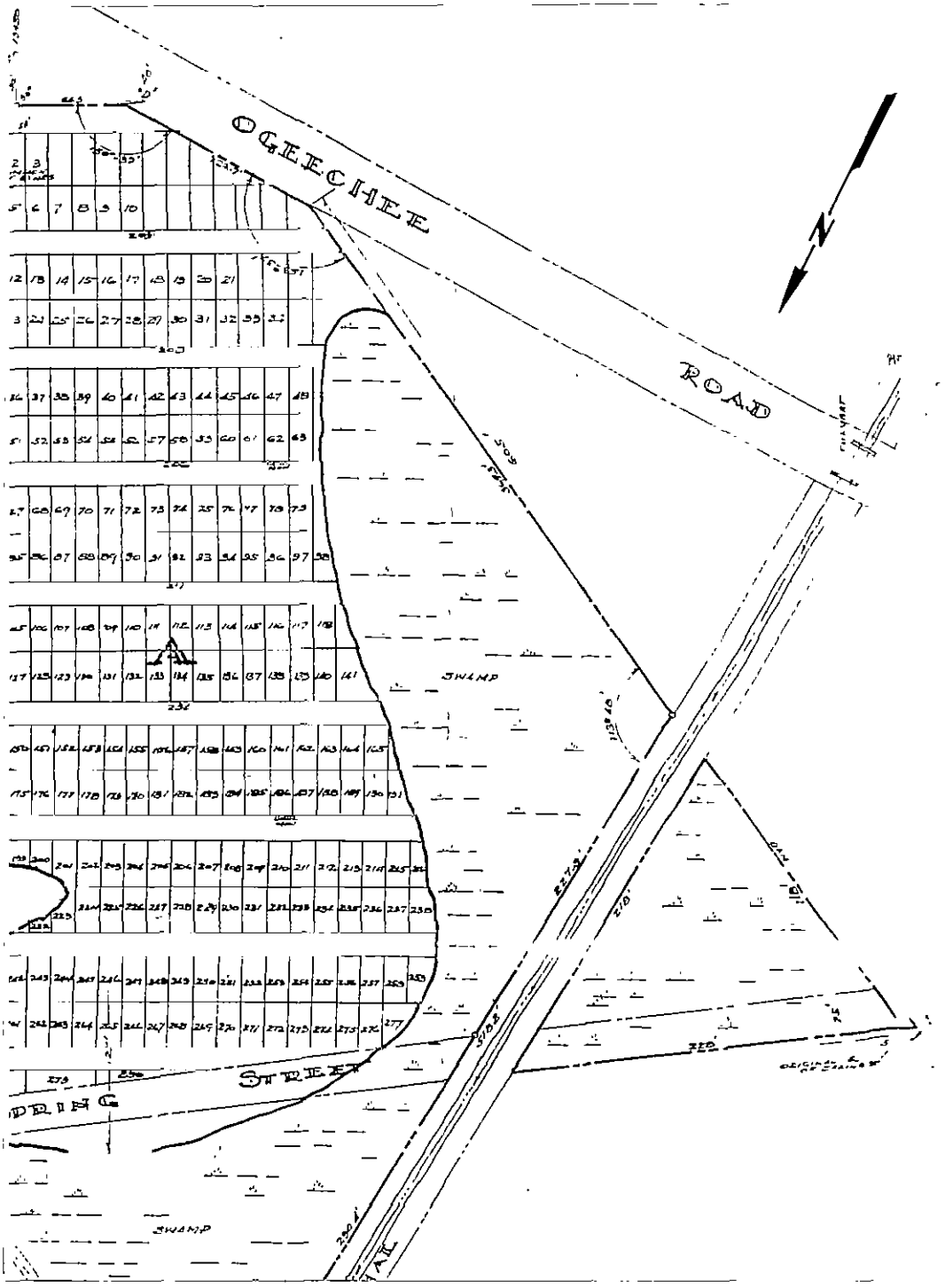

Figure 12. Portion of the 1961 *Atlas of Laurel Grove Cemetery, Savannah, Georgia, Colored Section* showing the location of the Springfield Canal and adjacent lands.

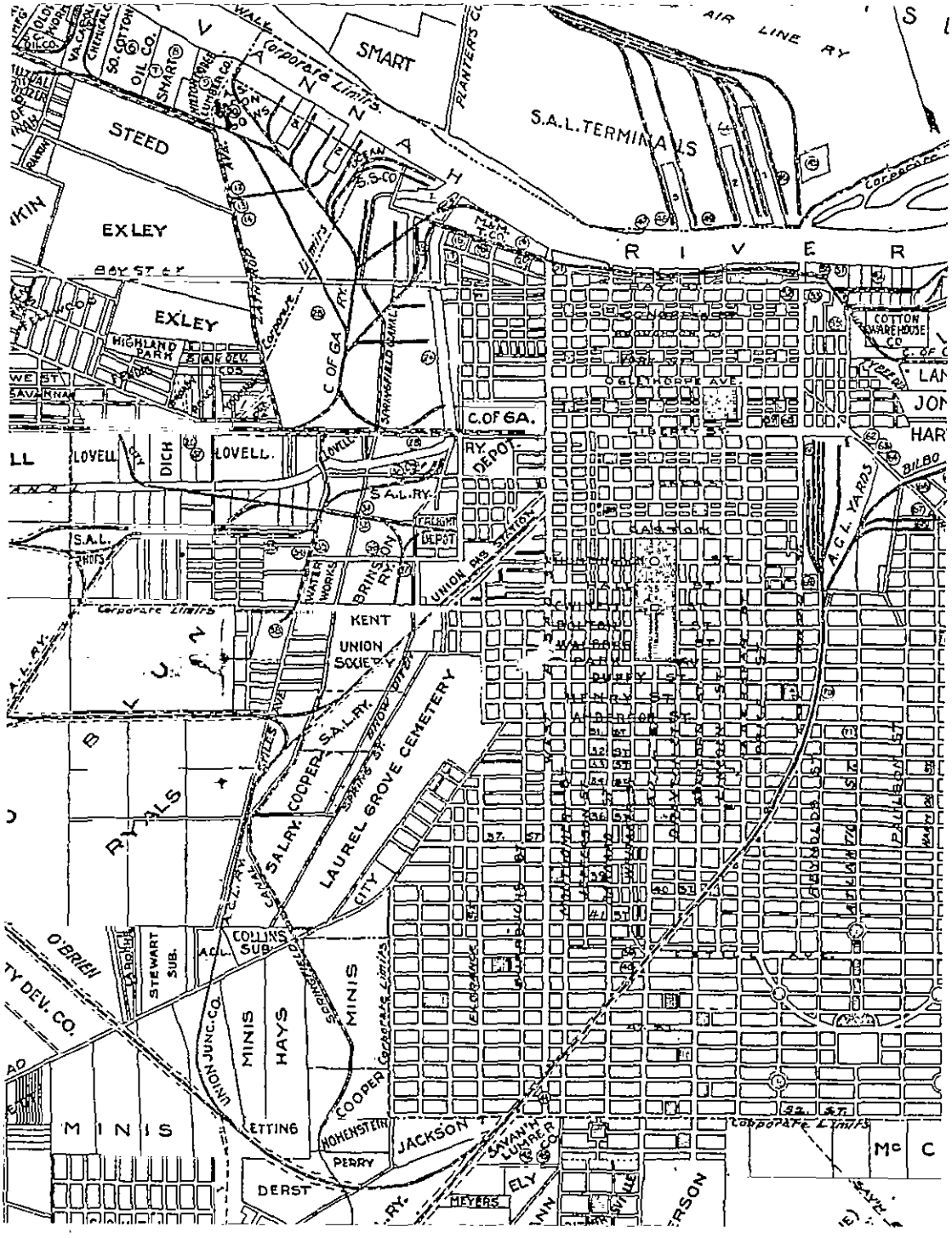

Figure 13. Portion of the c. 1910 *Map of the City of Savannah* showing the project area and adjacent development.

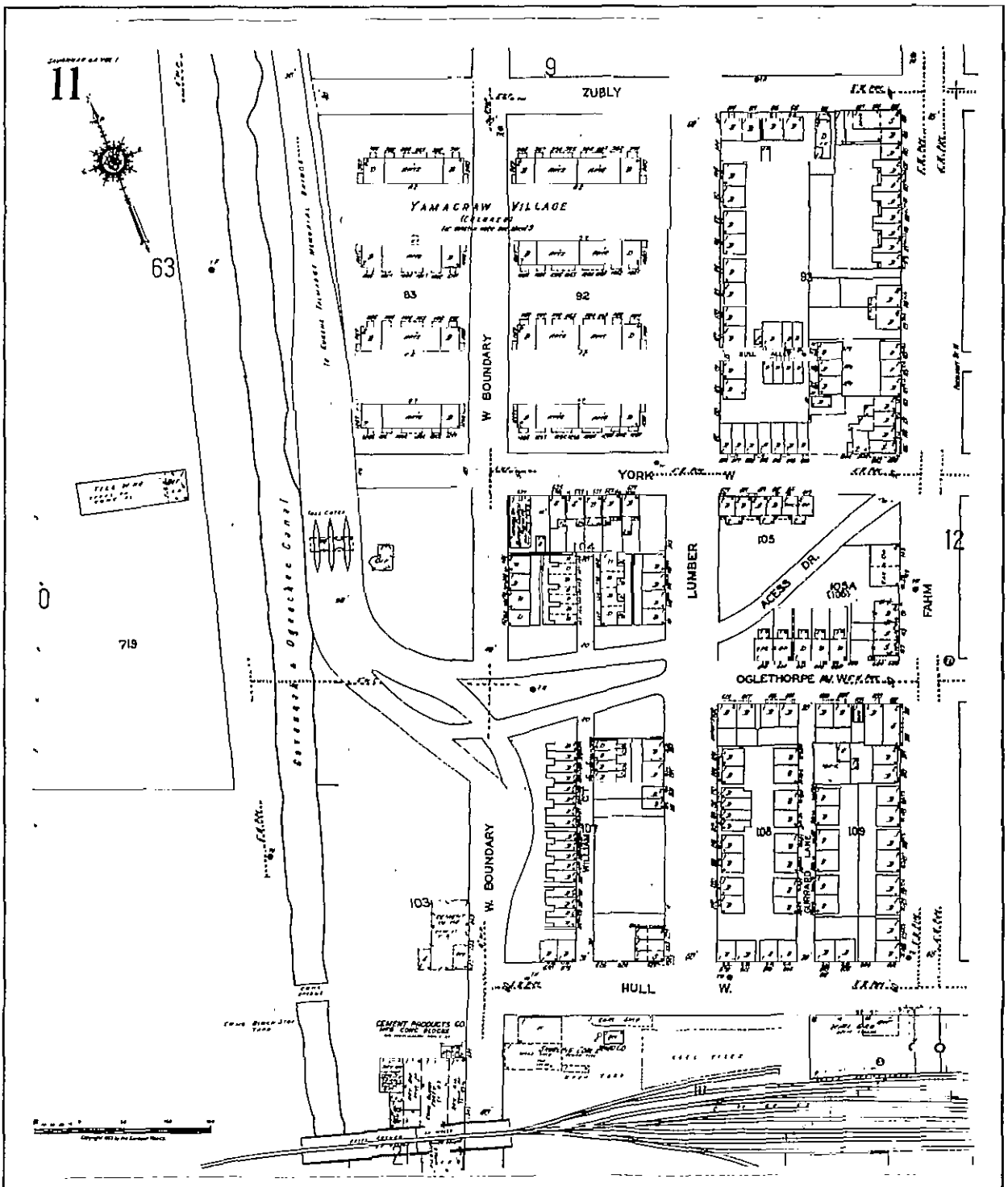

Figure 14. Sheet 11 of the 1954 Sanborn Maps for Savannah showing the project area from York Street south to the Dooley Yard Viaduct.

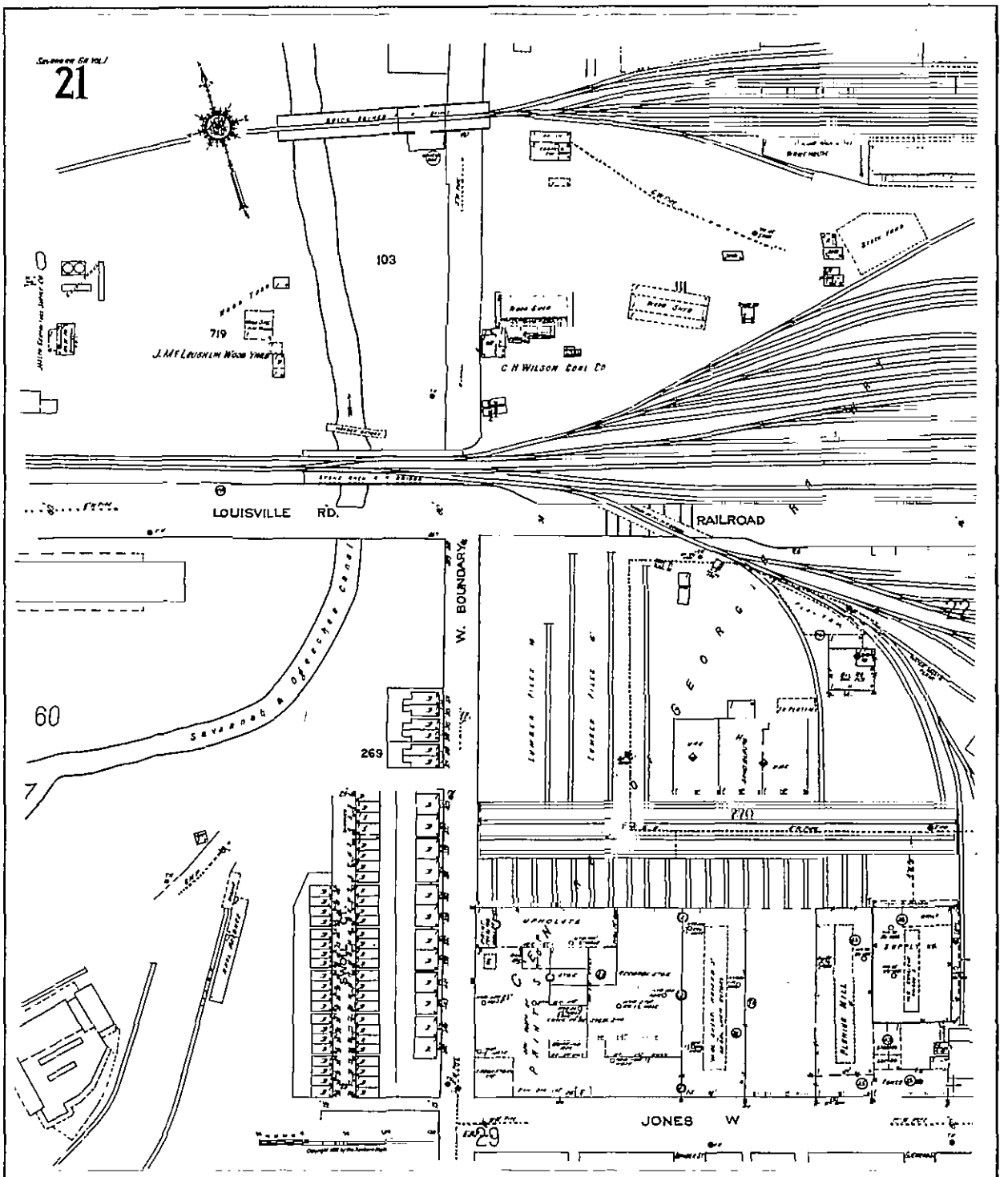

Figure 15. Sheet 21 of the 1954 Sanborn Maps for Savannah showing the project area from the Main Line Viaduct south to past Louisville Road.

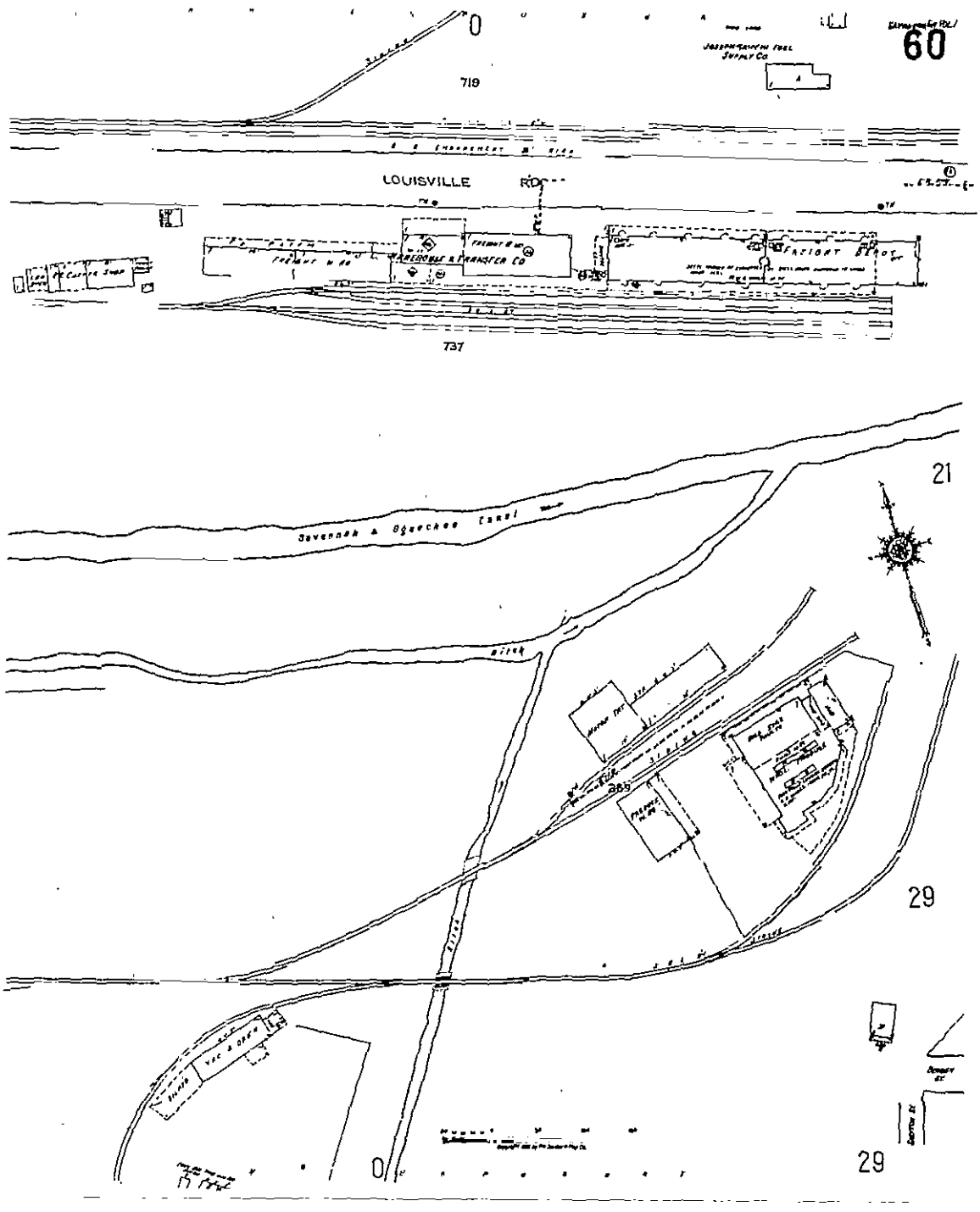

Figure 16. Sheet 60 of the 1954 Sanborn Maps for Savannah showing the project area past Louisville Road.

maintenance limited to cleaning with a drag line and spraying to minimize vegetation. Even the National Register nomination for the S&O Canal comments on the extent that the surrounding area has been changed since the canal's abandonment (Hendricks and Spoolstra 1997:n.p.).

ARCHAEOLOGICAL SURVEY

Methods

As previously discussed, the survey proposed was shovel testing at 100 foot intervals along both banks of the canal from the project beginning at station 13+00 to the terminus at station 69+00. We anticipated running only one transect of shovel tests down each side of the canal since the project corridor was proposed to be only 75 feet each side of the canal center line.

All shovel tests were about 1-foot square and were excavated to subsoil, typically 1.0 to 1.5 feet in depth. All fill would be screened through ¼-inch mesh with the tests backfilled immediately afterwards. Each shovel test would be marked in the field, should it be necessary to return to that area for additional study or documentation. All materials recovered from shovel testing, except brick and mortar which were to be noted and discarded in the field, would be bagged. Shovel tests were to be sequentially numbered.

Notes would be retained on representative shovel tests and photographs were taken of individual sites if warranted in the opinion of the field director. At each site the information necessary for the completion of a Georgia Archaeological Form would be collected.

Should archaeological remains be encountered in the project, additional shovel tests would be excavated at closer intervals (25 to 50 feet) in order to better determine site boundaries, collect additional materials, and help assess the site's potential National Register eligibility.

In the vicinity of the Laurel Grove Cemetery the goal of determining if graves might be present adjacent to the canal edge required a different methodology. Along the eastern edge of the Canal we anticipated using a penetrometer to determine if graves were present. A penetrometer, which measures ground compaction in pounds per square inch (psi) is considerably more precise and reliable than a tile probe, often used to identify graves. Areas of posited graves will have a lower psi readings than those where there has been no digging.

Penetrometers, often used by forensic anthropologists (including the Federal Bureau of Investigation), are curiously used only infrequently by archaeologists conducting more routine studies. Chicora Foundation, however, has been using penetrometers for the past year and a half with excellent success. While a penetrometer *may* be little better than a probe in the hands of an exceedingly skilled individual with years of experience, such ideal situations are rare. In addition, a penetrometer provides quantitative readings which are replicable and which allow more accurate documentation of cemeteries.

Like probing, the penetrometer is used at set intervals along grid or transect lines. The readings are recorded and may be used to develop a map of probable grave locations. Prior to this, however, it is important to "calibrate" the penetrometer to the specific site. Since readings may be affected by soil moisture and soil texture, it is important to compare readings taken during a single investigation. It is also important to compare suspect readings to those from known areas. Over the past year and a half we have found that graves in coastal plain soils typically have readings of under 100 psi, often as low as 25 to 50 psi. Non-disturbed areas will have compaction levels of 150 to 200 psi. These ranges have proven remarkably stable at over a dozen different cemeteries examined throughout South Carolina (see, for example, Trinkley and Hacker 1997).

Of course, the penetrometer cannot distinguish a grave from any other excavation or even a filled-in tree throw. It is only detecting the disturbance of the soil. While ground truthing may be necessary, an adequate degree of confidence

Figure 17. Shovel testing on the east bank of the S&O Canal about station 13, view to the north.

Figure 18. S&O Canal corridor from station 16+50 looking north toward Oglethorpe Street ramp.

may be obtained if the identified graves are all oriented in the same direction, form rows, and/or are evenly spaced.

These methods were put into effect with only minor modifications.

The Project Area

Prior to discussing the results of the field survey, it may be helpful to quickly retrace the corridor and its current settings. Beginning at station 13+00 the corridor is heavily impact by both the urban setting and also, on the east side of the canal, by construction of the new pump station (Figure 17). From Oglethorpe Avenue southward the corridor becomes somewhat more scenic. A recent concrete bridge which provides access to the old Ramada Inn (now used by the Savannah College of Art and Design) crosses the canal at station 16+50. To the north of that bridge, back toward Oglethorpe Avenue the banks are open and grassed (Figure 18). To the south, they are open on the west side, but heavy brush is present along the east bank, at least to the construction site of the current bridge replacement at station 19+20 (Figure 19).

In the vicinity of the Dooley Yard Viaduct northward to the bridge replacement the banks on both sides exhibit heavy deposits of modern concrete blocks, apparently deposited in the canal during the 1950s by the concrete manufacturing plant that was in operation. Figure 20 shows this area and reveals that while the western viaduct arch was built on the edge of the canal, the eastern footing was apparently placed about 10 feet beyond the water, similar to the condition found during the survey.

Between the two viaducts on the western bank there is open grass, and a sewer line has been constructed in the center of the proposed survey corridor (Figure 21). Shovel tests in this area were typically placed closer to the bank in an effort to avoid the sewer. This was only partially successful. While the sewer could be avoided with this strategy, a tremendous amount of recent fill was nevertheless encountered. On the opposite (eastern) bank the vegetation is thick, consisting of scrub trees and grass. The sewer crosses from the east side of the canal under the Louisville Road, although another sewer line, also crossing under this same bridge picks up on the west side and runs off to the southwest, impacting only a portion of the corridor around stations 26+00 to 27+00.

From station 26+00 to station 32+00 the northern side of the canal is overgrown with trees and dense vegetation, while the south side is primarily open and grassed (Figure 22). This continues to about station 38+00 where both sides begin to be heavily overgrown and the north side begins to become lower and more swamp-like (Figure 23).

The section from station 39+00 (about at Gays or Number 2 Lock) to station 45+00 is open on the southeast and vegetated on the northwest, where it continues to be low and wet (Figure 24). Two wooden railroad bridges span the canal in this area. At station 44+80 an abandoned trestle is present, while at station 50+00 the trestle is still in use.

A sewer runs down Dixon Street and turn along the eastern edge of the canal at station 56+00. This sewer, running about in the middle of the project corridor continues for the remainder of the project corridor and periodically crossing the canal to service development along the opposite bank (Figure 25). In the area from station 50+00 to Gwinnett Street at station 64+00 the east bank is generally open, running along the edge of Chatham Steel and the associated railroad yards. In some areas there is only the canal bank separating the project area from low wetlands. The western bank, in contrast, is lower with much of the topography in swamp. South of Gwinnett Street the topography remains level. The sewer continues along the eastern edge, while parking and a small development is found along the western edge (Figure 26).

This overview reveals that there are a variety of factors in the project corridor which affected the survey. Although virtually all areas were accessible with some effort, there were dramatic differences in both topography and the nature of the canal edge. In many areas the soils

Figure 19. S&O Canal from station 16+50 looking south toward the Main Line Viaduct.

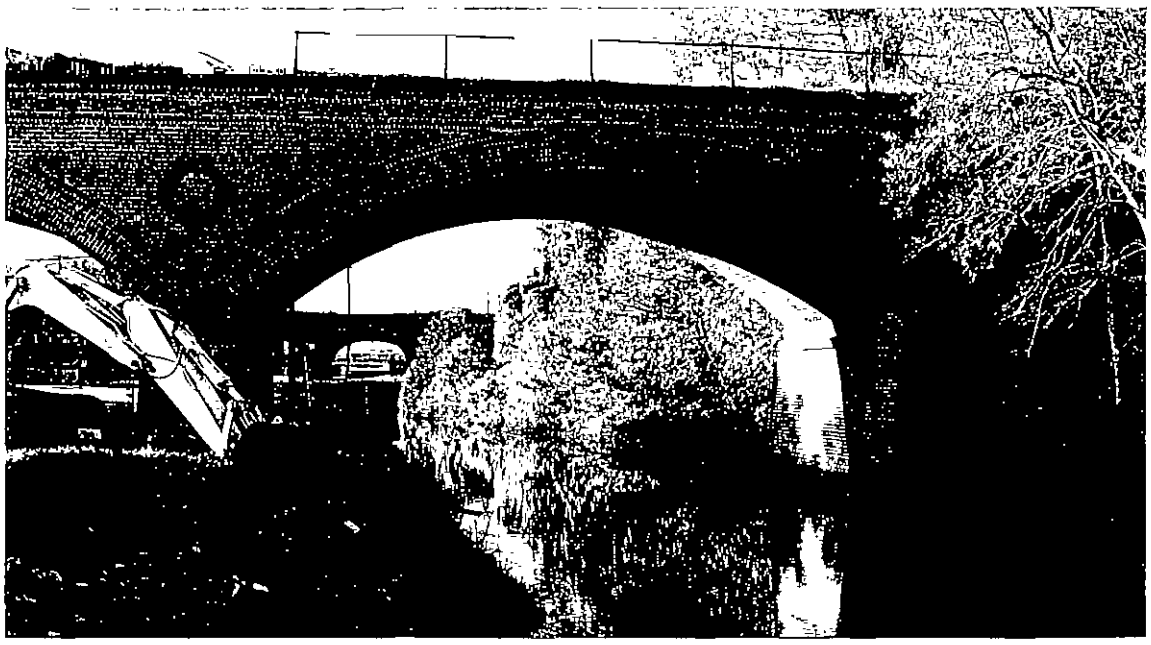

Figure 20. S&O Canal under the Main Line Viaduct with the Dooley Yard Viaduct in the background, view to the south.

Figure 21. S&O Canal corridor looking toward the Dooley Yard Viaduct, view to the south. Note the sewer line running down the eastern edge of the canal.

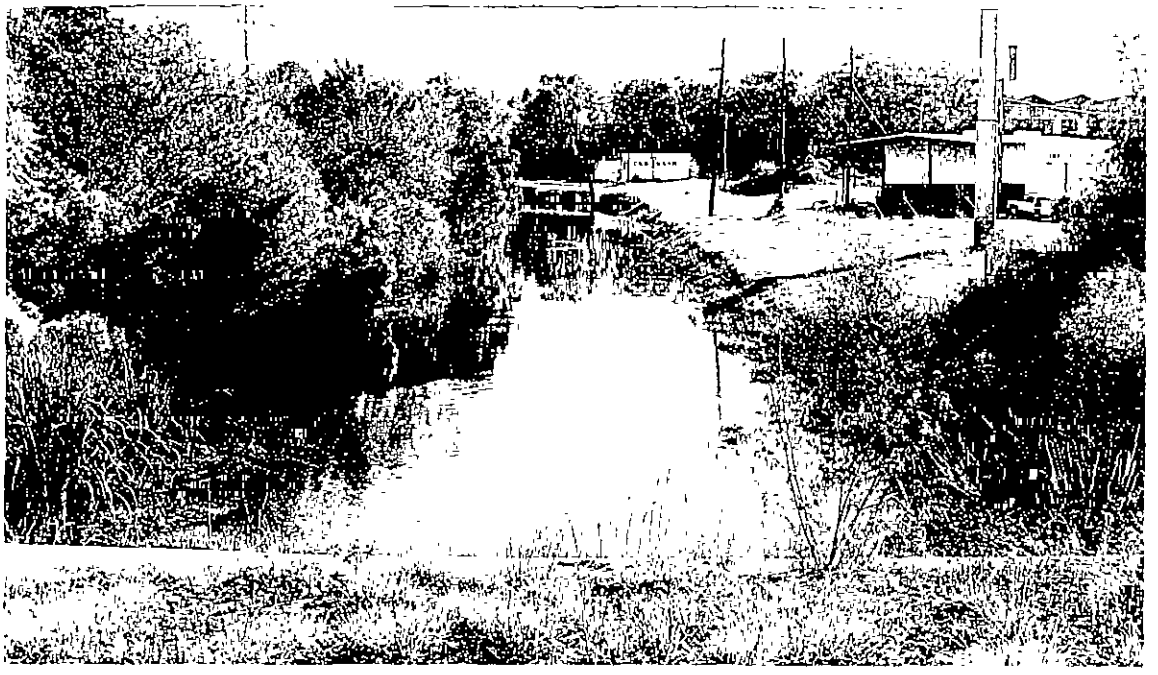

Figure 22. S&O Canal corridor east of the Talmadge Bridge off-ramp, looking east.

Figure 23. S&O Canal corridor from the Talmadge Bridge off-ramp looking to the west.

Figure 24. Section of the Springfield Canal from the abandoned railroad trestle at station 44+80 looking north toward Gays or Lock Number 2.

Figure 25. Springfield Canal corridor from the Gwinnett Street bridge looking north.

Figure 26. Springfield Canal corridor from Gwinnett Street bridge looking south toward the project terminus.

were very low and swampy. Several shovel tests were not excavated because of standing water or water within the upper 0.5 foot of the test, especially south of Louisville Road (i.e., in the area of the Springfield Canal).

In addition, north of Louisville Road much fill was encountered in the shovel tests, almost certainly the same conditions which caused DePratter and Doyon to abandon shovel testing in their 1984 survey. Although we continued our shovel testing efforts, we realized that in many areas we were excavating through recent (i.e., early to mid-twentieth century) fill of limited historical significance. Also, we were often excavating shovel tests in areas that originally would have been within the canal water limits.

There were some sections of the canal edge which, for archaeological purposes, were extensively damaged. For example, it is likely that the sewer construction along portions of both banks, has thoroughly disrupted any archaeological remains that might have originally been present.

No effort was made to shovel test the vicinity of Gays or Lock Number 2, since this lock segment has been filled during the twentieth century. At the present time it is difficult to interpret all of the sections of brick and rock wall still visible.

Finally, the survey was conducted at a time when the waters in the canal were very high — both because of the tidal level and also because of extensive rain the previous two weeks. As a result, the high water levels made it impossible to see the banks of many canal sections. In addition, many bank sections were heavily overgrown (perhaps because of the maintenance cycle) and even if the water had been lower, it is questionable how much would be visible.

As a result, this survey did not identify any of the wood bulkheads reported by DePratter and Doyon (1984:31) simply as "north of Louisville Road" or by Hendricks and Spoolstra as:

> at mile 0.6 of the canal . . . parallel to West Boundary Street just north of the Oglethorpe Avenue crossing (Hendricks and Spoolstra 1997: n.p.).

Since this project includes only 100 feet north of Oglethorpe, it may be that these bulkheads are within the confines of the new pump station construction.

Results

As a result of this investigation two concentrations of materials identified as archaeological sites were encountered (Figure 27).

9CH879

Site 9CH879 was encountered on the eastern edge of the Springfield Canal at station 49+50. This is about 30 feet north of the wooden railroad trestle still in use and the central UTM coordinates are E489630 N3548520. This site is at an elevation of about 7 feet above mean sea level (AMSL) and appears to be incorporated into both the dike and/or trestle fill. Vegetation consists of dense weeds and scrub hardwoods. To the west the ground drops into freshwater wetlands.

Shovel Test 34 yielded a small quantity of historic materials, including one stoneware ceramic with Bristol slip exterior and Albany slip interior, six burned refined earthenware ceramics, six aqua bottle glass fragments (including one with a crown cap lip), seven fragments of clear glass, 10 fragments of melted glass, one fragment of window glass, one 6d wire nail, and several fragments of animal bone (including one with cut marks). These were found in the upper 1.5 foot of dark brown sand loam. No base to the deposit was encountered.

Neither of the shovel tests at 100 foot intervals to the north or south (Shovel Tests 33 or 35) produced any materials, so an additional shovel test was excavated 50 feet to the north, parallel to the canal edge. This shovel test produced no historic material and exhibited a distinctly different soil profile, more in keeping those found elsewhere on the project, consisting of brownish-gray sands overlying a gray clay. No shovel tests were

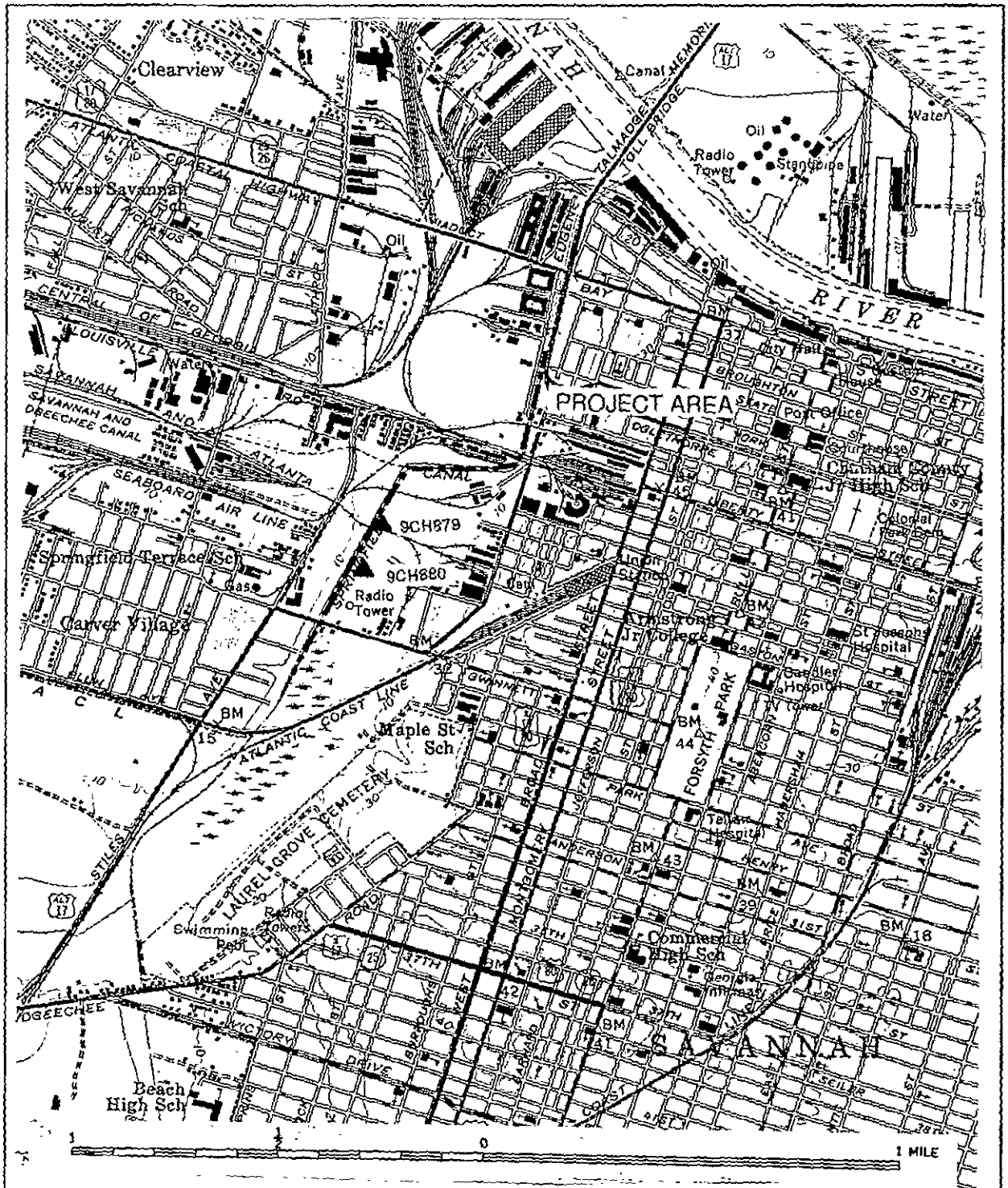

Figure 27. Location of identified archaeological sites 9CH879 and 9CH880 and other resources in the project corridor.

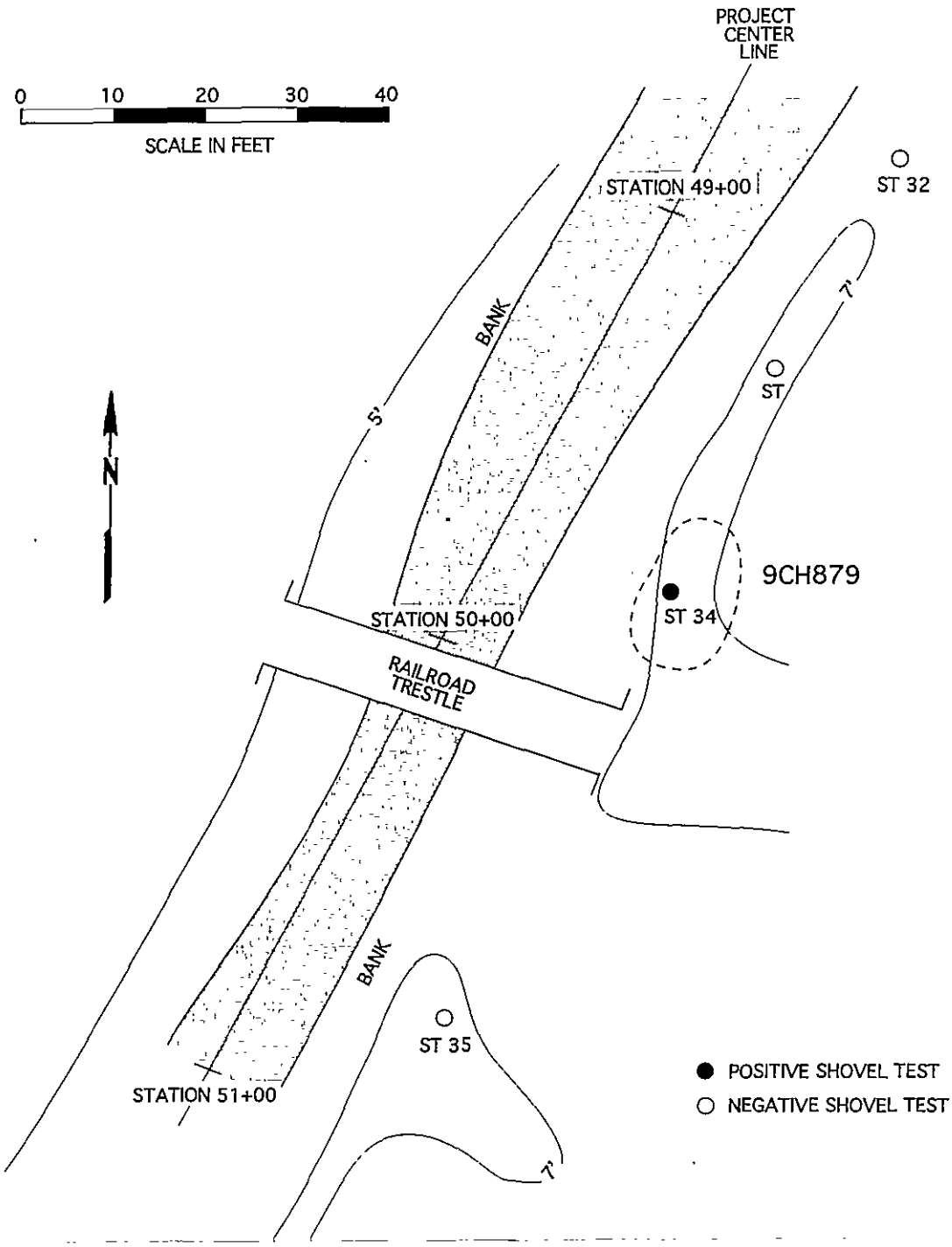

Figure 28. Sketch map of 9CH879 and its general vicinity.

excavated to the east or west of the positive test since the canal bank was on one side and very low swamp land was on the other. Likewise no shovel test could be excavated to the south since that would be in the middle of the train trestle (Figure 28).

As a consequence, this site is estimated to measure about 30 feet in diameter and to be confined to the canal dike. The materials themselves appear to date from the late nineteenth or early twentieth century. The nature of the remains suggest that they are a secondary deposit, perhaps brought in as fill during the construction of the embankment. Alternatively, these materials may represent materials used in the construction of the railroad trestle embankment, which intersects the Springfield Canal in this general area.

9CH880

This site was also found on the eastern edge of the Springfield Canal at station 60+00. This is about 400 feet south of Dixon Road, which at one time crossed the canal on concrete piers. The central UTM coordinates are E489500 N3548300 and the site is at an elevation of about 7 feet AMSL. To the east of the site is the rail yard associated with Chatham Steel, today filled with scrap metal and piles of debris. Portions of the original tracks are still present and the rail yard control station is visible in the distance. These facilities are segregated from the canal right-of-way by an electrified fence (Figure 29). Vegetation consists of sparse weeds and occasional scrub trees.

Shovel Test 43 yielded a number of historic remains, including one white porcelain ceramic, one blue on white porcelain, six undecorated whiteware ceramics, one fragment of black bottle glass (dark green in transmitted light), two fragments of brown bottle glass, three aqua glass fragments, seven fragments of clear glass, four fragments of window glass (one is thick with molded lines), 17 fragments of melted clear glass, one iron eye hardware fragment, one unidentifiable iron fragment (possibly a handle to a gate or lock box), one unidentifiable iron disk, and several fragments of animal bone (including cut fragments).

These artifacts were found in a stratum of brown sandy loam about 1.5 feet in depth. Associated with the artifacts were many fragments of what appeared to be crush run or cement/lime nodules, typically produced by firing the raw materials. Below this artifact bearing level a yellow sand lens about 0.2 foot in depth and then a gray clay, typical of the soils in the survey tract.

Since neither Shovel Test 42 or 44 yielded any materials, additional tests were placed parallel to the canal at 50 foot intervals. These tests were also negative. No shovel tests were excavated perpendicular to these tests since to the west was the Springfield Canal and the electric fence prevented further investigation to the east.

These artifacts, like those found in Shovel Test 34, appear to be deposited at this location from some other location. They also appear to be associated with the cement material and the specimens that are burned suggest that they may have been included with the material in its preparation (although not all of the items are burned). The materials, unlike 9CH879, represent items from throughout the nineteenth century, the porcelain and black glass suggestive of an early to mid-nineteenth deposit.

The site is estimated to measure about 15 to 20 feet in diameter and is also situated in the immediate area of the sewer line running parallel to the canal bank. The shovel test profiles, however, suggest that the sewer excavation is placed further to the west, at the edge of the canal bank.

Other Archaeological Remains

The shovel tests along the canal revealed six additional areas of minor remains. These areas, however, failed to produce sufficient materials to qualify as an archaeological site and likely represent materials lost or scattered in the canal area, or possibly hauled into the area as fill. They are briefly discussed here, but have not been assigned site numbers.

At Shovel Test 12 (station 25+00) on the east side of the S&O Canal just north of the

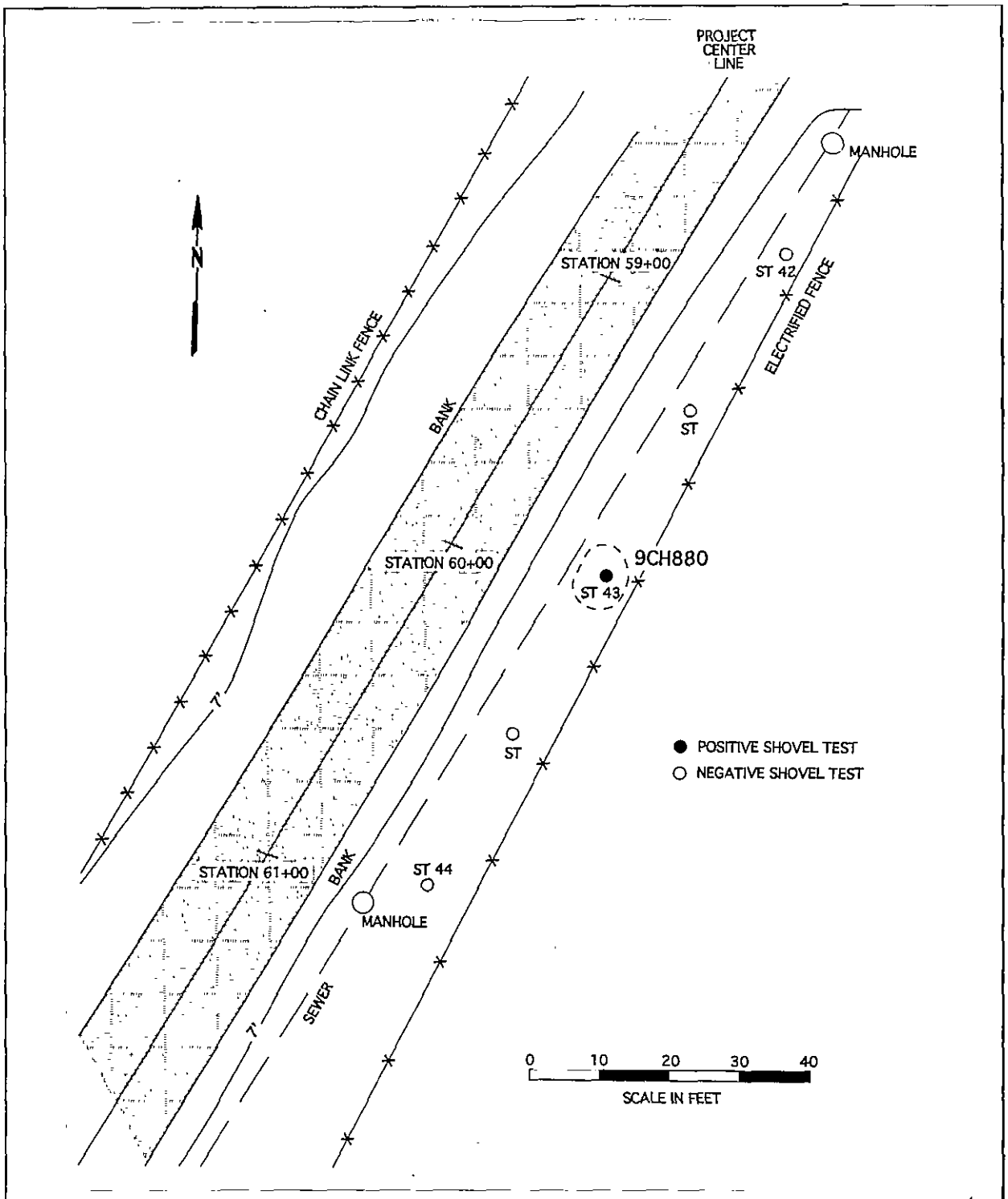

Figure 29. Sketch map of 9CH880 and its general vicinity.

Louisville Road bridge an iron bar measuring 3½ inches by 1 inch by ⅝-inch was recovered from the upper 1.0 foot of brown sandy loam soil. No other materials were encountered in the test and this item may represent twentieth century debris.

Shovel Test 13, placed on the east bank of the S&O Canal, immediately south of the Louisville Road bridge (station 26+00) yielded one undecorated whiteware (from a bowl form with a 6-inch diameter), one stoneware fragment, two aqua class fragments, and three unidentifiable nail fragments. Although this unit did not produce sufficient materials to define a site, shovel tests were excavated to the south and east at 50 foot intervals. Both of these additional tests were negative. While not realized at the time, these remains may be from a structure on the south side of the Louisville Road bridge shown in the 1852 plan of the area (Figure 8). No matching remains, however, were found on the west side of the canal.

Shovel Test 29 was dug about 200 feet south of Gays or Number 2 Lock on the east side of Springfield Canal at station 44+00. This test produced a single unidentifiable iron fragment from the upper 1.0 foot of brown loamy sand. No other materials were encountered in tests dug at 50 foot intervals to the north or south.

Shovel Test 39 was excavated at station 55+00 about 100 feet north of the former Dixon Drive right-of-way on the east side of the canal. This test produced two fragments of window glass and an unidentifiable iron bar fragment. The ground was undulating in this area, suggestive of possible spoil piles. However, additional tests were excavated to the north and south of the positive shovel test at 50 foot intervals. Neither test produced additional materials.

Shovel Test 49 was excavated about 300 feet south of Gwinnett Road on the east bank of Springfield Canal at station 66+00. One tinted whiteware ceramic, one fragment of window glass, one fragment of reinforced glass, and one unidentifiable nail fragment were recovered from the test. Unfortunately, it was not possible to avoid the sewer line which ran in this area and it is likely that these materials are either associated with the construction of that line or that the site they were associated with was completely destroyed by the sewer's construction. Additional tests 50 feet to the north and south failed to reveal any additional materials.

Examination of Laurel Grove Cemetery

The Springfield Canal today runs northwest-southeast along the west side of an oxidation pond west of Laurel Grove Cemetery and then cuts through the southern corner of graveyard. South of the oxidation pond the canal runs through an area of swamp on both sides, and this swamp backs up on the southwestern side of Laurel Grove (Figure 30). In the area where it cuts through Laurel Grove proper (Figure 31) there is no surface indications of any burials and the historic research (see Figure 12) reveals that the area was never sold as plots. In fact, even with drainage, much of this area is very wet.

Nevertheless, in order to determine if burials might be present along the canal right-of-way, the penetrometer was first used in a portion of the cemetery adjacent to the study area. Readings of between 25 and 100 psi were obtained for known graves, with most falling between 25 to 75 psi, perhaps indicative of the very moist soils in the area. During this testing we were able to discover that there were, if fact, unmarked graves in this known section of Laurel Grove.

From these the investigations moved to the canal edge. A single transect of penetrometer reading was made for a distance of 200 feet along the eastern canal edge at 3 foot intervals. The area investigated was that closest to the known graves, where there was the greatest possibility that unrecorded burials might have been placed. All of these test revealed soil compaction of 200+ psi. No evidence of disturbed soil was identified in any area (Figure 32).

These results strongly suggest that there are no graves within the Springfield Canal right-of-way adjacent to this portion of Laurel Grove Cemetery. Of course, it is possible that they might exist elsewhere, but this seems very unlikely given

Figure 30. Springfield Canal corridor south of the oxidation pond, looking toward Laurel Grove Cemetery.

Figure 31. Springfield Canal adjacent to Laurel Grove Cemetery, looking south. Penetrometer testing was conducted in this area.

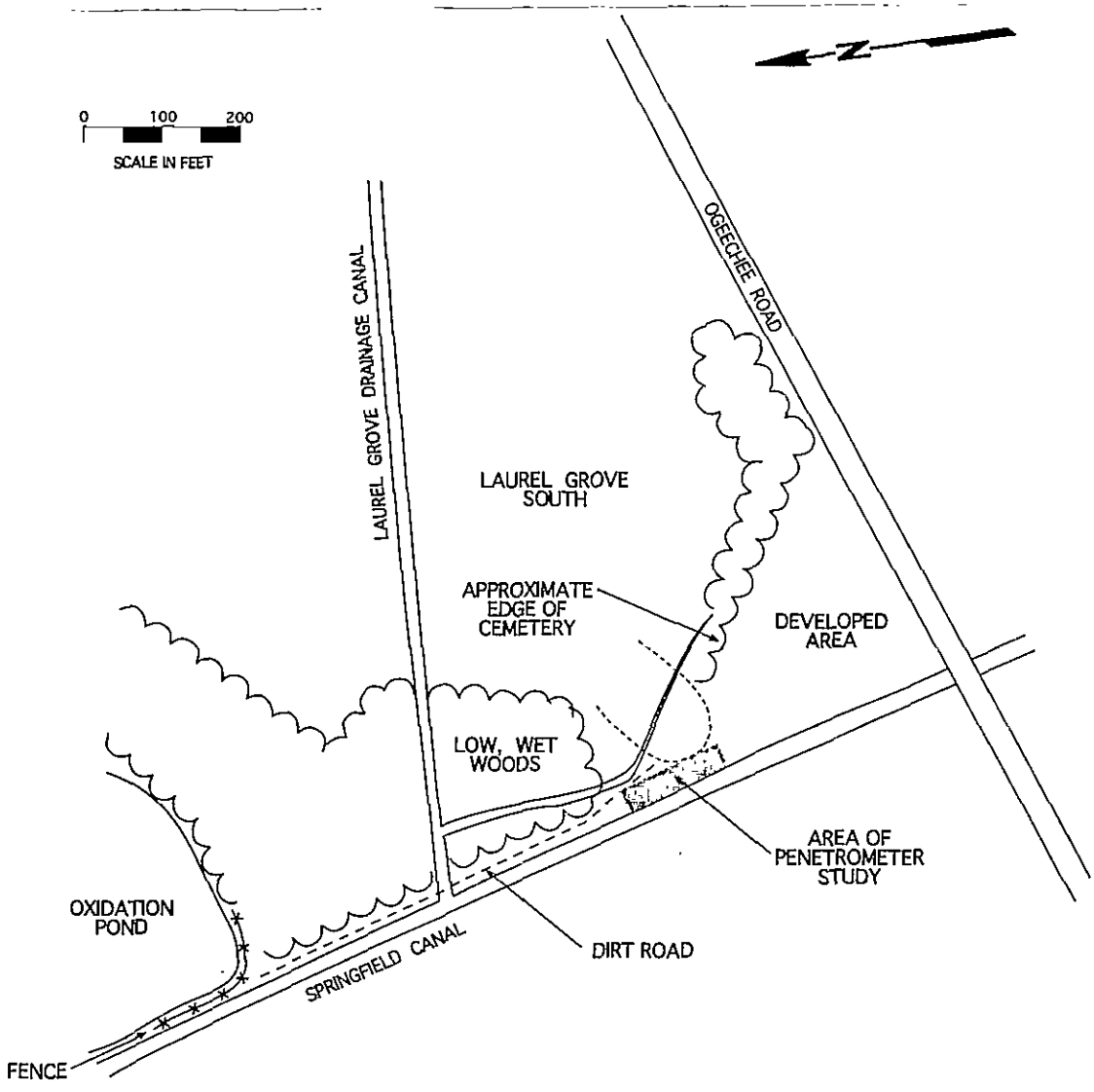

Figure 32. Sketch map of Springfield Canal and the area of penetrometer testing at the edge of Laurel Grove Cemetery.

both the historic documentation and also the topography. Not only was Laurel Grove a planned cemetery with a full-time caretaker, but individual lots were sold and rather carefully surveyed to help ensure that the City made its funds on the endeavor. In addition, the planned lots stopped where the land became so wet that burials, without additional drainage, were impossible. The topography in the vicinity of the canal simply does not support the idea that graves were ever excavated in these areas.

STRUCTURAL ASSESSMENTS

The Central of Georgia Railroad Viaducts

The National Register nomination for the Central of Georgia Railroad, Savannah Shops and Terminal Facilities included the two brick viaducts crossing the Savannah and Ogeechee (S&O) Canal (DeLony 1978). Since both are currently listed (and are part of the National Historic Landmark District), this discussion will only offer a brief summary.

Both are thought to have been designed by Mueller and Schwaab, architects, with the masonry work done by Benjamin F. Armstrong. The nomination does not include any plans for the two viaducts. Many of the railroad's drawings are currently housed at the Georgia Historical Society, although this study did not seek to identify plans for the two bridges.

The Main Line Viaduct is reported to have been constructed in 1853 (DeLony 1978), although an 1852 map shows the bridge to already have been in place. It is the southern of the two bridges and is situated at station 24+70. It is constructed on Savannah Gray brick and consists of three-centered arches of 35-foot span center to center of the piers and supported tracks on a deck 38 feet in width. The total length of the viaduct is 200 feet. The National Register nomination notes that it exhibits:

> decorative, semi-circular arches in the parapet with a dentilated brick cornice and red sandstone capping. The piers are relieved by brick pilasters with semicircular arched openings in the spandrels that provide drainage (DeLony 1978: n.p.) (Figure 33).

Even a cursory inspection reveals that the viaduct has undergone extensive renovations through time. Figure 34 reveals several episodes of less than sensitive repointing, much if not all with

Figure 33. Main Line Viaduct from the eastern side of the S&O Canal looking south. In the background is the Louisville Road Bridge.

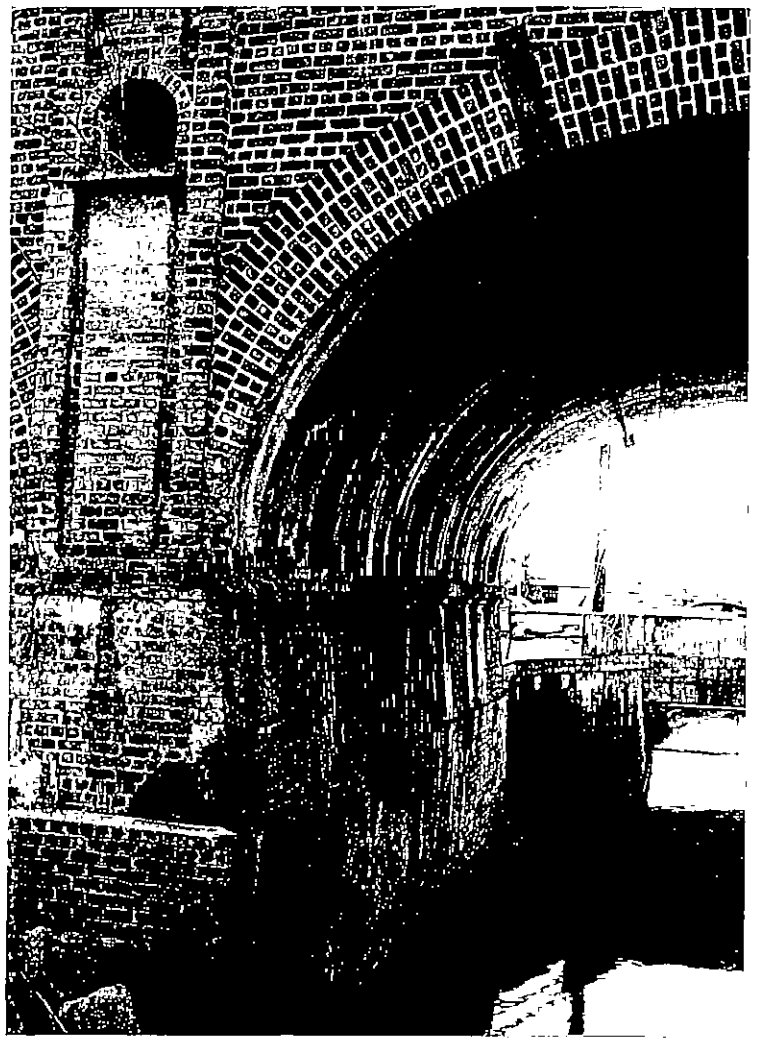

Figure 34. East portion of the Main Line Viaduct arch segment over the S&O Canal, looking south.

a very hard cement mortar. Iron rods have been inserted to help strengthen the undersides of the arches. Some of these tension rods are still in place, others are missing. The National Register nomination notes that both bridges were in place for over 100 years "without strengthening, in spite of the fact that the locomotive tonnage increased over 400 percent" (DeLony 1978:n.p.). It is likely that these tension rods were probably put in place while the viaduct was being used. They were, however, limited to the one span crossing the S&O Canal. This suggests that it may not have been the tonnage of the locomotives which caused the engineers' concern, but rather the action of the fluctuating water levels against the bridge's foundation.

This assessment gains additional credence when it is noted that additional brick work, using a different type of brick and a different bonding pattern are laid up against one of the piers supporting the mass of the arch on the edge of the canal. This work may have also been done to help relieve strain caused by erosion or scouring around the foundation.

In addition, there is some loss of brick work on the piers. Throughout there is vegetation growing from the mortar joints. There is extensive water leakage from the deck through the mortar mass, penetrating under the arch. In some areas there appears to be migration of salts through the masonry.

The proposed action will not directly impact this viaduct. Although the canal is being widened on both sides, it will be tapered to maintain the existing opening and rip rap is proposed to help support the banks.

Nevertheless, based on the condition of the brick work, the poor repointing and maintenance, and other factors reported here, we strongly recommend that a structural engineer with experience in historical preservation be retained to evaluate this viaduct and ensure that the plans will not further weaken or endanger the bridge.

In addition, rip rap is not historically appropriate for this time period and the City of Savannah should strongly consider alternative techniques to secure the banks of the canal in this area. These may include use of wood and/or brick bulkheads constructed behind cofferdams.

The Dooley Yard Viaduct is through to

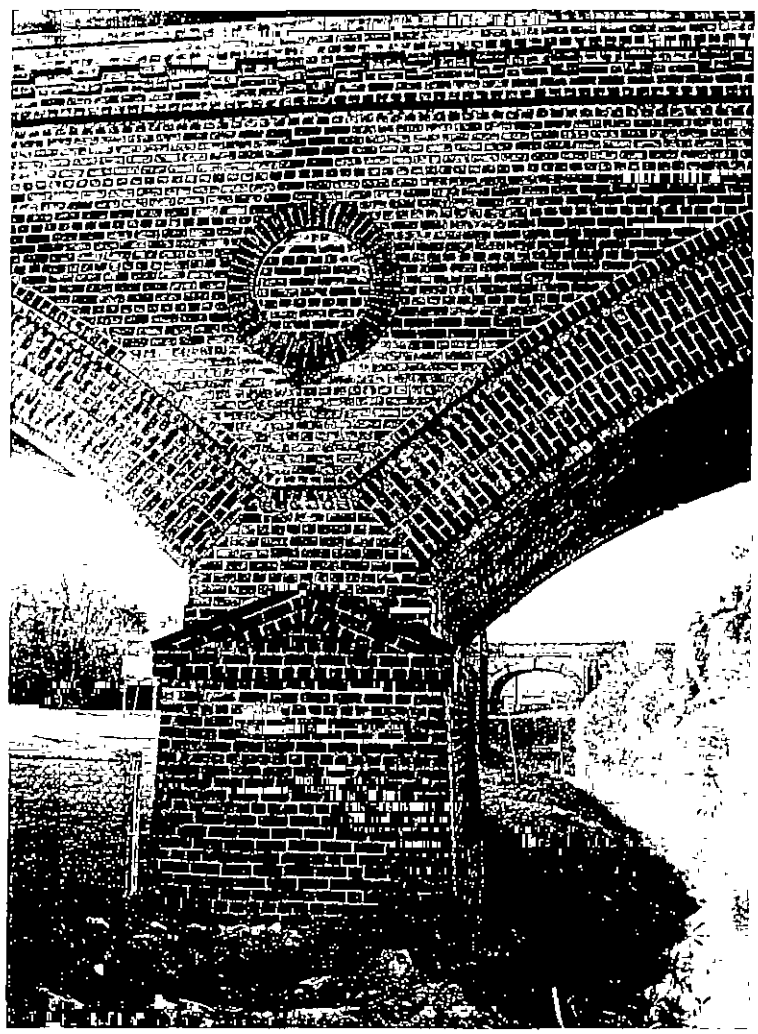

Figure 35. Pier of the Dooley Yard Viaduct on the east bank of the S&O Canal, looking south.

have been constructed in 1860, although an earlier date for this bridge is also possible. It is situated at station 21+00 and consists of four shallow, segmental arches of 60 foot span center to center of the piers and also supported a double tract on a 31 foot wide deck. Today the tracks have been removed, leaving only the soil fill and a few timbers. A pipe railing is also in place, although it appears to be twentieth century in origin. The total length of the structure is 241 feet.

The National Register nomination observed that:

> the viaduct exhibits high quality masonry work in the friezed cornice and parapet, the projecting brick course that follows the curve of the arches, and the brick rondels that relieve the mass of the spandrels. The arches rest on short piers enhanced by a pedimented motif (DeLony 1978:n.p.) (Figure 35).

This structure appears to be in better shape that the Main Line bridge, although it, too, has been rather poorly repointed and exhibits several areas with substantial loss of mortar joints. This structure has also been integrated into a modern antique store, built in the center arch. It is unknown what, if any impact, this may have had on the structural integrity of the viaduct.

Along the west bank the viaduct's abutment is placed on the edge of the canal, while to the east the pier is apparently on firm ground (although it may be that filling of the canal has simply encompassed a portion of the pier).

As with the Main Line Viaduct, the proposed canal widening is proposed to taper in to the existing channel at this bridge, so there will no direct impact. No rip rap is proposed for this area.

Although this span appears to be in better shape than the Main Line Viaduct, we strongly recommend that a qualified structural engineer with experience in historic preservation be retained to evaluate this structure and the potential that changes in water flow patterns (either during construction or afterwards) might create scouring or cause other problems. In particular we are

concerned that previous deposition of fill may have damaged the pier or its setting. The removal of this fill, which allow water movement, but at slow rates, may change soil conditions around the footing. In addition, the driving of piles for the bridge replacement at station 19+20 may also have had an affect on the structure.

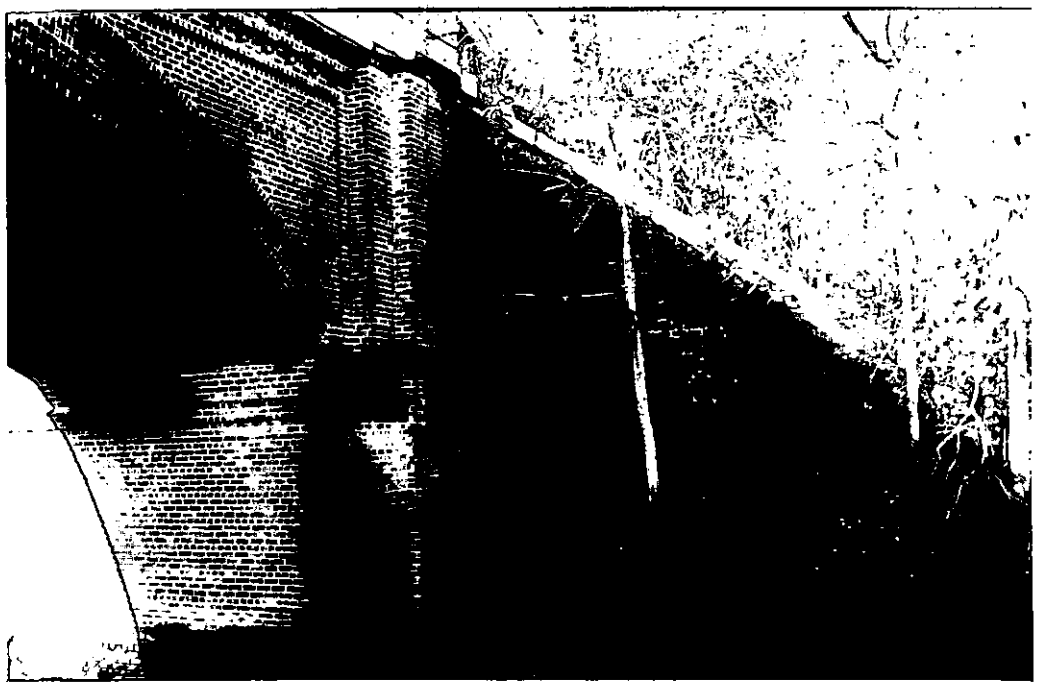

Figure 36. Dooley Yard Viaduct over the S&O Canal, view of the northwestern abutment.

The Louisville Road Bridge

Relatively little information has been provided in previous studies concerning this bridge. In fact, the only mention is a single sentence in the S&O Canal nomination which states:

> Louisville Road crosses the canal on a short, low, historic highway bridge; built c. 1920, it is a jack-arched steel-stringer design, with a concrete deck, with at least one surviving historic pipe railing (Hendricks and Spoolstra 1997:6).

The earlier DePratter and Doyon survey dismiss the bridge, noting only, "the numerous other bridges that cross this segment of the canal are recent in origin and have little or no historical or architectural significance" (DePratter and Doyon 1984:37).

The Louisville Road bridge is situated at station 25+30 and the current project does not call for its removal. It is likely, however, that in the future (perhaps near future) replacement of this structure will become essential. The Georgia Department of Transportation (DOT), which conducts bridge inspections uses the sufficiency rating system which grew out of the Federal-Aid Highway Act of 1970.

As part of the Special Bridge Replacement Program, designed to help the states replace unsafe bridges, procedures were established to develop a numerical "sufficiency rating" to help evaluate the condition of bridges. The sufficiency rating is reported as a numerical value between 0 and 100, arrived at by applying a mathematical formula to inventory data. The lower the rating, the higher the priority for replacement. Structures with a rating of less than 50 were eligible for replacement with federal funds.

The sufficiency rating takes into account structural adequacy and safety (i.e., the load-carrying capacity), serviceability and functional obsolescence (i.e., geometric an traffic capacity

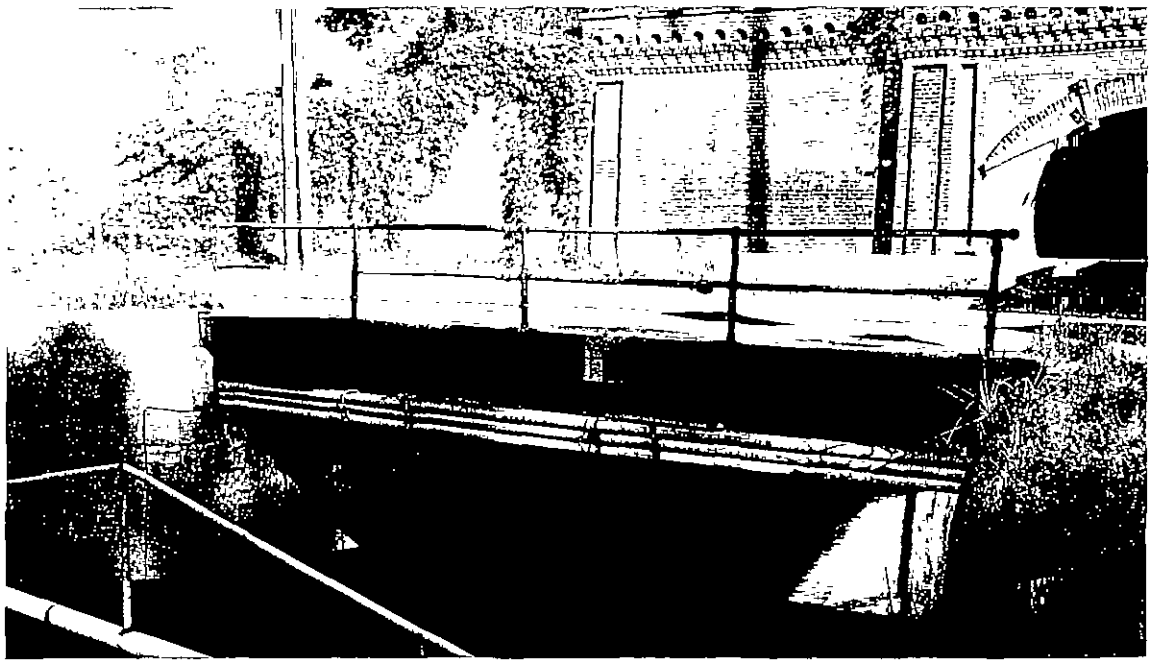

Figure 37. View of the Louisville Road bridge, looking to the north.

Figure 38. Example of the pipe railing on the south side of the Louisville Road bridge.

features), essentiallity for public use (primarily the importance for national defense), and special reductions for specific deficiencies which might include proximity to alternative crossings, below-standard transitions, and certain types of structures.

The Louisville Road bridge currently has a sufficiency rating of 36.1 (Joe Cannon, personal communication 1997). This is well below the level of 50 typically used as a cut-off for replacement purposes and is the basis for our speculation that it will be scheduled for replacement in the near future. Currently the bridge is evaluated by the Georgia DOT as not eligible for inclusion on the National Register, but we believe that this evaluation should be reconsidered in light of the data developed during this assessment.

The Georgia DOT has relatively little information on this bridge (for example, no plans are available), although they estimate that it was built in 1930. It is situated on a secondary or M-Route" system, although the bridge apparently belongs to the City of Savannah. The Georgia DOT are likely the source for the statement that the structure is a "jack-arch" bridge, since this term is not commonly used in the Southeast.

Upon inspection, the bridge was found to consist of a concrete deck approximately 33 feet 2 inches in length with two travel lanes each about 11 feet in width, plus a concrete sidewalk on the south side and a narrow shoulder on the north side.

On the south elevation there is a pipe railing about 3 feet ½ inches in height with the individual sections each approximately 7 feet 3½ inches in length (Figures 37 and 38). Portions of the pipe railing are intact and are evidenced by simple decorative balls at terminal elements. Connectors are also rounded. Portions of this pipe railing have been replaced, with the new pipe marked "WHEATLAND USA 60." The portions remaining are generally in fair to poor condition, exhibiting moderate corrosion. The replaced portion has been partially spot welded into place, the connecting threads of the ball junction being broken off. Portions of the pipe railing which would originally have followed the abutment on the east side are missing, leaving the railing to terminate at the sidewalk.

On the north elevation the pipe railing has been largely replaced with a cast cement wall (Figure 39). This wall is clearly a replacement of the previous railing — being both a different color and different mix than the bridge itself. In addition, the pipe railing between the bridge and the nearby Main Line Viaduct is still in place, the concrete wall butting against the surviving pipe railing sections. The pipe railings themselves terminate in holes sunk in the brickwork of the viaduct.

During our research we identified plans for the Louisville Road bridge over what was called the "Ogeechee Canal" dating to 1915 in the City Archives. This bridge, while similar to that currently in existence, is clearly not the same structure. It appears that the 1915 bridge partially replaced an earlier span, incorporating portions of the original brick abutment on east side, as well as a concrete deck that extended to the brick viaduct. The 1915 structure included some new full height concrete abutments (although their design did not include a bridge seat), as well as a new deck of concrete with integrated steel I-beams 32 feet 2 inches in length. This deck carried a sand base over which were laid brick for the roadway, incorporating trolley tracks in the center of the deck. No railing is indicated in the plans.

One possible conclusion is that the ca. 1930 bridge currently in place replaced the early 1915 bridge, although it seems unlikely that a 15 year old bridge would be replaced, absent structural failure. Another possibility is that the 1915 plans were never executed. Review of late historic city maps reveal a bridge drawn to suggest that the paving extended to the viaduct — similar to the configuration shown in the 1915 plans. By the time of the 1954 Sanborn Maps (Figure 15), Louisville Road is clearly wider than the span over the S&O Canal, suggesting that the current bridge was in place. Regardless, there is nothing about the current bridge which precludes its construction

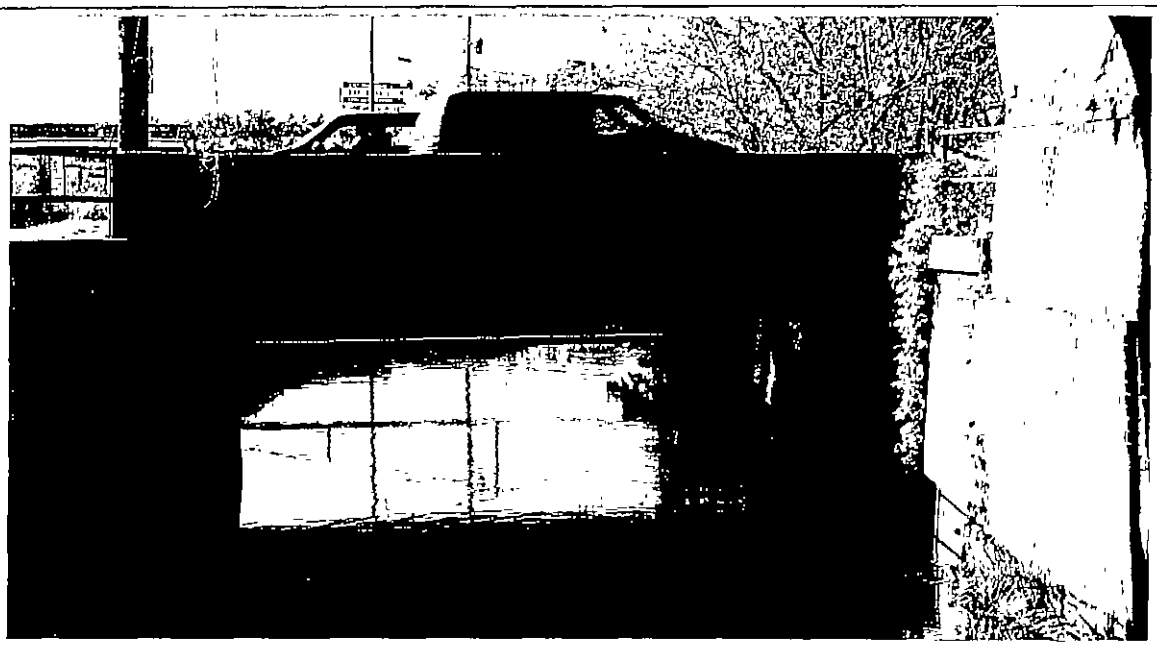

Figure 39. North elevation of the Louisville Road bridge, showing the pipe railing replaced with a concrete wall.

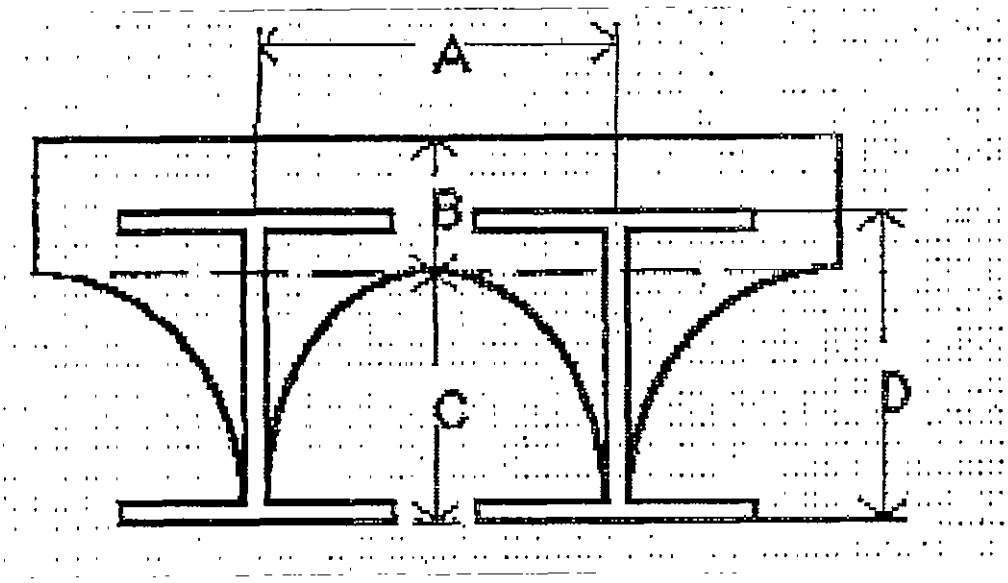

Figure 40. Drawing of a "composite jack arch" provided by the Georgia Department of Transportation.

in the 1930s, although at least one bridge engineer questions that the bridge was a Works Project Administration project, since detailing such as the surviving railing is not typical of their ornate or embellished style, found even on small projects such as this (Bill Huffstetler, personal communication 1997).

Currently the abutments on both sides are full height concrete, although it cannot be determined if the early brick abutment (essentially the breast wall area) was removed or simply covered with concrete. It does not appear that the current abutments are the same as those shown on the 1915 plan since there are significant variations in measurements (although the form and placement looks similar).

As previously mentioned, the S&O Canal nomination calls this a "jack arch" bridge, a term also used by the Georgia DOT. This is a somewhat unusual term, not used in adjacent states. The Georgia DOT definition is fairly simple, noting that it is a "deck support system comprised of a brick or concrete arch springing from the bottom flanges of adjacent rolled steel beams" (Bill Duvall, personal communication 1997). In addition, they explained that their jack arch bridges were constructed by placing a longitudinally split corrugated metal pipe on the bottom flanges of steel I-beams and filling the void above with concrete to the finished grade. Figure 40 is a CADD drawing provided by Georgia DOT of what such an arch might look like.

In this situation, the corrugated pipe is used to support the concrete during decking, combining the strength of both the split pipe with that of the concrete to act compositely, hence the term also used by Georgia DOT, the Composite Jack Arch. Nevertheless, Bill Huffstetler notes that the terminology:

> is a little misleading because the primary method of load carrying in the bridge is that of the beams. The "jack arches" are simply the forming system for the deck, although they also appear to participate in the final structural system (Bill Huffstetler, personal communication 1997).

As a result, one might argue that the structure itself is not a jack arch bridge, but rather a beam bridge using a jack arch system to form the deck. This is seen for the Louisville Road Bridge in Figure 41.

Regardless of terminology, this is the only such bridge in District 5 (comprising the southern coastal corner of Georgia) and may be the only such structure in all of Georgia. In addition, Bill Huffstetler, a structural engineer with Wilber Smith Associates' Columbia Office, who has conducted historic bridge assessments in surrounding states, notes that he has encountered no similar bridges in his work.

Returning to our brief discussion of bridge assessment in Georgia, outlined in Table 1, it is possible to tentatively assess this particular bridge.

In terms of *integrity*, the bridge is in its original location and there is no indication in either historical sources or in the structure itself which suggests that it has been moved. The surrounding area, or setting, has not changed dramatically since the bridge was installed. Although traffic has certainly increased, the bridge is situated on what might be called an industrial edge of Savannah and it has not been developed. There likewise appears to be a relatively high integrity of design. The only above deck level alteration of form has been the replacement of the pipe railing on the north side with a concrete wall. Below the deck there has been some alteration through the addition of utility lines, although these changes are not immediately noticeable. In a similar fashion, most of the original materials are present, again except for a substantial portion of the north pipe railing. Although this might be argued to be "routine maintenance," the change is significant and noticeably detracts from the design. A better case for routine maintenance can be made for the replacement of pipe sections on the south railing, since in this area the form has remained consistent. There is, in general, similar integrity of workmanship, with the only major detractor being the loss of the pipe railing on the

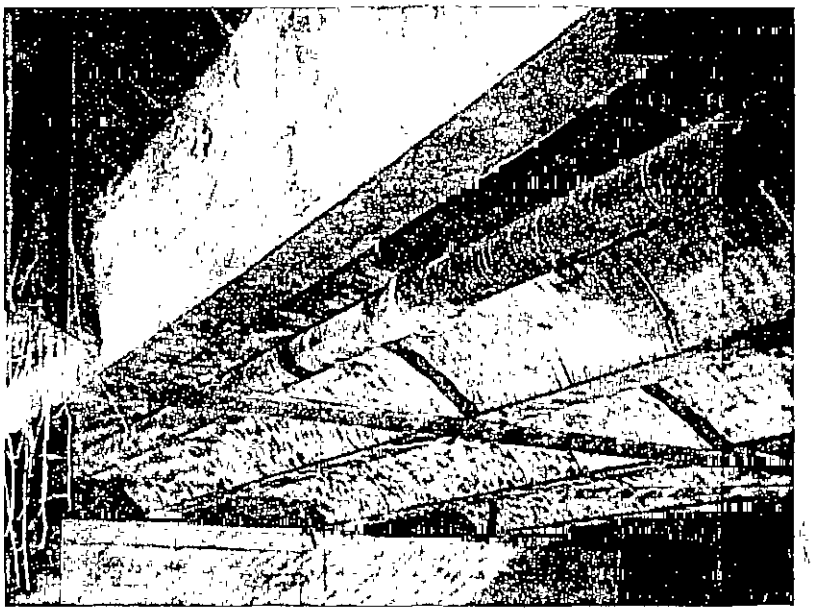

Figure 41. Underside of the Louisville Road bridge showing split corrugated culverts set on the bottom flanges of the I-beams.

north side.

In terms of *representativeness*, this bridge does appear to have the ability to characterize this decking system. Of course, this evaluation is made more difficult by the bridge's *singularity*. The Louisville bridge may be the only jack arch bridge in existence in Georgia and is certainly one of only a very few in the southeast based on conversations with other bridge engineers. This uniqueness makes it difficult to evaluate how representative the bridge might have been when built.

In terms of condition, considered only insofar as it affects integrity, the bridge must be given a modest rating. The loss of the northern pipe railing and the rather insensitive replacement using a solid cast-in-place concrete retaining wall does detract from its overall appearance and, one even argue, overall representativeness. While this certainly affects its aesthetic qualities, it does not necessarily affect the bridge's ability to represent this engineering form.

Although some questions remain concerning the exact *chronology* of the bridge, there is no question that it is at least 50 years old. As such it meets the minimal age criteria for the National Register.

It is, of course, difficult to discuss *historical associations* at the specific site level. There is no evidence, for example, that this bridge is associated with a particular bridge builder or company. Nor does it appear to be representative of any important period of bridge building. Yet, there is evidence that this bridge form may be unique to Georgia, representing a distinct local solution to a common bridge construction problem. As such it appears to represent a very unique local approach and may have significant historical associations on this level.

In terms of *place association*, this is a traditional crossing, with some type of bridge spanning the Savannah and Ogeechee Canal in this location since its construction in the mid-antebellum. Although we cannot argue that it maintains the environment of any specific earlier crossing, it is not "spoiled" by recent commercial incursion. In addition, since Louisville Road predates the canal, the roadway itself is historic, representing one of Savannah's earlier western corridors.

Finally, there is the questions regarding the bridge's ability to provide information — either valuable information or information not otherwise available. Given the simplicity of this bridge form, it might be argued that information content is minimal, in much the same way it has been argued that architectural data from "low architectural sites" is minimal when compared to higher status sites. Yet it seems impossible to ignore that this may be the last surviving example of this bridge form. In addition, one wonders if this design was an adaptation of readily available local materials (corrugated metal pipe using for drainage in the

Georgia low country) to the immediate needs of increasing bridge construction, including increasing weight loads. As such it may represent a very clever adaptation of locally available materials and technology to meet the challenges of mid-twentieth century bridge work.

When these various factors are considered, we recommend the bridge as eligible for inclusion on the National Register of Historic Places. We note again, however, that the current project will not impact the bridge and there will be no widening of the canal in this area.

Gay's Lock

Also known as Lock Number 2, this lock is situated at the junction of the S&O Canal and Springfield Canal, at station 41+00 on the current project. Of brick side-wall construction with a plank floor, it was about 102 feet in length and 18 feet in width, with a lift of 3.5 feet. The Springfield Canal passed under the S&O Canal using the three brick conduits (Hendricks and Spoolstra 1997:6; DePratter and Doyon 1984:12).

At the time of their survey, DePratter and Doyon observed that the lock was only partially preserved:

> the eastern end of the lock and a portion of the retaining walls are also present, but not well preserved (DePratter and Doyon 1984:34).

Hendricks and Spoolstra observe that the lock's:

> north wall is substantially intact by the south wall has been nearly obliterated by the rerouting of the Springfield Drainage Canal which now connects to the Savannah and Ogeechee Canal at this point. During the rerouting (to provide storm drainage), a 300-foot

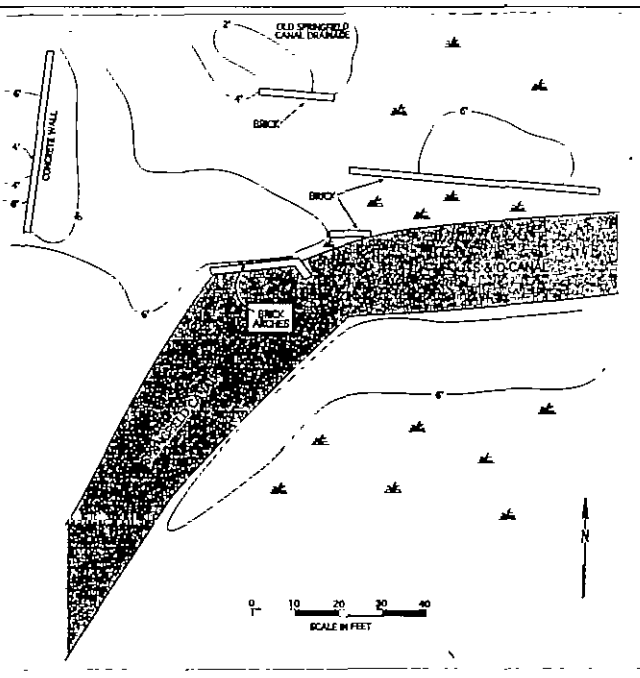

Figure 42. Sketch map of the extant features associated with Gay's or Lock Number 2.

Figure 43. Two of the three brick arches used to channel the Springfield Canal under Lock Number 2, view to the north.

Figure 44. Section of the south lock wall, looking to the northwest.

segment of the Savannah and Ogeechee Canal beginning at Lock 2 and proceeding west was filled (this segment of the canal is now contributing to the district) (Hendricks and Spoolstra 1997:6). Although not specified, it is likely that the filling was a WPA project to enhance drainage in the Savannah area.

Encountered by the current survey are four sections of brick walls and one concrete wall (Figure 41). The concrete wall (Figure 42) was apparently constructed to block the S&O canal from the lock, effectively closing the lock for filling. It appears, therefore, to represent a late addition to the lock area. Along the bank, a portion of the three arches routing the Springfield Canal under the S&O Canal are still visible from the water (Figure 43). The opposite end of the conduits are only slightly above grade, but are shown in Figure 41. About 110 feet of brickwork are visible along the canal edge (Figure 44) and this wall appears to represent the southern wall of the lock. The northern wall is not visible, or at least was not encountered during this survey. There is another section of brick just east of the arched openings, the function of which is not known.

The decision has already have been made that this portion of the filled-in S&O Canal is not a contributing resource, suggesting that the disturbance to the canal is sufficient to render this section not eligible on its own merits or as part of the larger complex. Nevertheless, the National Register nomination was based only on Criteria A and C and the archaeological significance of this canal section does not appear to have been evaluated (although the nomination does mention the archaeological resources of other sections). Consequently, it does not appear that Gay's Lock has been evaluated as an archaeological site.

The current survey, while documenting those sections extant, has not undertaken as coring or effort to evaluate the archaeological remains that *might* still be present under the twentieth century fill. As a result, the lock is recommended potentially eligible for inclusion on the National Register of Historic Places under Criterion D, that it may yield information important in history. Specifically, the lock may be able to document the construction techniques and features of this particular lock construction. Comparison with the remaining extant portions of the canal may also help document the similarity and differences of lock construction. Furthermore, there may be intact cultural material intact under the modern fill, representing materials lost or discarded into the canal either during its use or after its economic abandonment.

The current project, however, will not impact the lock or its remnant brick walls. Widening efforts, terminating in this area, will be entirely on the side away from these features. In the area of the arches, the project provides for the placement of a geotextile overlaid by rip-rap to prevent the brick from being damaged by the drainage currents. During construction, straw bales will be placed along the susceptible portion of the lock wall.

Our only recommendation for the area of Lock Number 2 is that further evaluation be given to the need for additional rip-rap along this wall. Although not on a curve (like the arched openings) and therefore less likely to be affected by flow, we do not know the depth of this brick wall and rip rap may help prevent erosion from undercutting and toppling the wall through time.

CONCLUSIONS

Archaeological Assessment

An intensive archaeological survey of the proposed Springfield Canal Drainage Improvement project from station 31+00 to 69+00 (approximately one mile) has been undertaken with certain limitations. For example, no underwater archaeological investigations were undertaken, although the dredging of the canal most likely precludes the recovery of any materials in the extant channel. Likewise, the survey was conducted at a time of high water, so it may not have been possible to identify all materials only partially submerged. In addition, the shovel tests along the S&O Canal portion were largely conducted in areas which represent fill and as a result, relatively few artifacts were identified. Certainly we did not penetrate to the base of this fill.

Nevertheless, the archaeological survey identified several areas where small quantities of artifacts were encountered, although the numbers were not sufficient to warrant being designated as an archaeological site. In two additional cases the number of remains present were sufficient to define sites. 9CH879 consisted of a small quantity of mid-twentieth century materials that appeared to have been included in fill associated with a train trestle. 9CH880 included late nineteenth century materials, but also had the appearance of a secondary deposit, although its source was not as evident. Both sites consist of remains associated with single shovel tests.

At both sites the data sets are limited to the materials in the one shovel test. There is no evidence of features. In addition, the data sets present appear to be from another location and to have been transported to their current location, probably as fill.

As a result, both sites were recommended as not eligible for inclusion on the National Register. Pending the concurrence of the Georgia State Historic Preservation Office (SHPO), no additional management of these archaeological resources is proposed.

As always, it is possible that additional archaeological remains may be found during construction. All contractors working on the project should be notified that if archaeological remains, such as but not limited to, bones, concentrations of pottery, bricks, bottles, stone tools, worked wood, are encountered all work should be suspended and the finds immediately reported to either the Georgia SHPO or Chicora Foundation.

Impact on the S&O Canal and Gay's Lock

The Springfield and Ogeechee Canal is currently listed on the National Register of Historic Places. As such, the proposed work must be evaluated in terms of its impact to the canal.

In the most general sense, the proposed work will help restore the canal to something more closely approaching its original appearance. In this respect the work may be viewed as good — it is helping to revitalize the canal.

We do caution that as the fill is dredged out of the canal there is the remote possibility that watercraft or other debris associated with the original canal may be uncovered. At the present time there is no cost-effective way to determine the likelihood of buried remains.[1] Consequently, the

[1] For example, coring is not likely to provide any real assistance discovering buried remains and in at least some areas coring has been made very difficult by the types of concrete and other objects used in the fill. Various geophysical techniques, such as ground penetrating radar and resistivity would likely be hindered by the nature of the debris, as well as archaeology's

contractors involved in this work must be cautioned that anything encountered that appears unusual or out of the ordinary should be grounds for halting work in that area and notifying either the Georgia SHPO or Chicora Foundation.

The work also has the ability to impact specific features. In particular, we have reviewed Gay's or Lock Number 2. In this area the proposed work will be entirely on the opposite side of the waterway and there are special provisions to use straw bales and rip-rap for short-term and long-term protection of the lock. It is absolutely essential that these provisions be carefully followed and that an inspector or project manager be on hand during work between stations 39+00 and 42+00 to oversee, and enforce, the requirements of the contract. In addition, we strongly recommend that the need to extend straw bale erosion protection further along the exposed brick walls be explored. It may be that additional protection in this area is warranted to ensure that the brick walls are not undercut by changes in water flow during or after construction.

Impact on the Central of Georgia Viaducts

These two brick viaducts are not only listed on the National Register, but are also part of a National Historic Landmark. They are considered very important and as the project is currently proposed, the widening of the S&O Canal will be tapered in the area of the two viaducts so that there will be no impact to the structures. We strongly recommend that a caution be included in the final plans and specifications to alert the contractor to this issue.

In addition, we have expressed serious concern over the stability of the Main Line Viaduct. It has received tie rods in the past (with at least one failing). There appears to be some reworking of the brick pier on the edge of the water. And there is also loss of some brick work, cracks, and vegetation growing in the mortar. We recommend that a structural engineer with experience working with historic structures be retained to evaluate this pier and the potential for water flow changes to cause undercutting. Steps should be taken to ensure that the pier is protected both during, and after, construction. The original plans for the viaduct may be housed by the Georgia Historical Society, which has acquired a large number of bridge plans from the Central of Georgia.

Although the Dooley Yard Viaduct does not appear to be in the same compromised condition, we recommend that it, too, receive this special attention. This effort, is not likely to be nearly as difficult or critical.

While not specifically related to this survey, it is perhaps appropriate to mention that these structures, which appear to be under the ownership of the City of Savannah, should be incorporated into a routine plan of inspection and maintenance. Inspection should include issues such as placing and reading crack gauges, inspecting for traffic damage, and inspecting the waterway edge. Maintenance should include such issues as repointing (using appropriate soft mortars) and removal of vegetation from brick joints. Without such inspection and maintenance it is likely that these structures will be increasingly placed at risk.

Impact on the Louisville Road Bridge

We have assembled the available historic documentation and structural overview of this bridge. Based on the currently utilized criteria for National Register evaluations, we have recommended that this bridge is eligible for inclusion on the National Register of Historic Places.

The proposed undertaking, however, will not impact the bridge. In this area the canal width will not be changed and the only activity proposed is dredging the bottom. While reasonable care should be exercised, we are recommending no additional steps.

Impact on Laurel Grove South Cemetery

In the vicinity of the Laurel Grove Cemetery the only activity proposed is routine

failure to develop identifications for signal patterns.

dredging. Although this will involve use of the currently maintained easement along the edge of the canal adjacent to the cemetery, no other activities are proposed.

We have examined the historical documents for this section of Laurel Grove Cemetery and found that they do not indicate any burials in the area of the proposed activity. This area has historically been low and swampy and no drainage activities have been undertaken to dramatically change that situation. This may account for the area not being used, although we are inclined to also believe that the project area was avoided because of its close proximity to the Springfield Canal. It is very important to understand that Laurel Grove was a planned cemetery and lots were sold. Although not all used lots have markers, the cemetery does have reasonably well maintained records. It is unlikely that burials would be placed (or allowed to remain) in areas not planned for graves or sold for that purpose.

In addition, we also examined the edge of the canal using a penetrometer, encountered no evidence of burials or any type of features. This approach has been used at a number of cemeteries with very good success and is routinely used in forensics to identify clandestine graves.

As a result, it seems unlikely that the proposed undertaking will have any impact on Laurel Grove Cemetery. Of course, the contractor should exercise reasonable care and should any unexpected materials be encountered, work should halt for an inspection.

Summary

Although we have made a number of recommendations regarding the way the proposed project is undertaken, or (in the case of the Main Line Viaduct) recommended additional study, in general it appears that the work will have minimal impact on the archaeological or historical features, sites, and structures in the project area.

Other than the specific items recommended in these discussions, no further investigation or research appears necessary prior to construction.

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